NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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Alternatives Catch Eye, Not Buy, of IBM Users

Almost all large IBM computer users have considered switching to alternative mainframes and two-thirds have gone as far as evaluating the independent CPUs, according to a *Computerworld* survey of 370/158 and 370/168 users.

However, while the users are apparently willing to at least look at the alternatives, less than one-fourth are actually switching from IBM systems.

In the survey, 97% of the users said they had considered the alternatives from Amdahl Corp. or Itel Corp., the rest — only 3% — indicated they were such confirmed IBM shops they would not even consider switching.

Of the sample, 65% had carried their considerations as far as an evaluation of the alternative equipment, 23% said they were gong to switch and 61% said the evaluation had convinced them to stay with IBM. The remaining 16% have not yet made a decision on the alternative equipment.

Cost advantages and better delivery schedules were cited as reasons for switching to an Amdahl CPU, although those fortunate enough to be listed for early Model 3033 processors from IBM said delivery was not a criterion for them.

Several users who decided against an alternative system said they had reservations about support from the non-IBM vendors and also doubted these systems could offer full software interchangeability.

Ford Motor Co. in Detroit — one of the users that decided to switch — has scheduled installation of an Amdahl 470V/6-II mainframe for November. The company made an evaluation of alternative systems when the lease on its 370/165 was nearing its end, a spokesman said.

The Amdahl machine was evaluated against an IBM 3033 CPU and found to have two advantages: it offered cost savings and it could be delivered sooner than the 3033.

The Ford DP center that will install the Amdahl CPU will swap the 165 for the 470 while keeping presently installed peripherals. These include Storage Technology Corp. tapes and disks and Memorex Corp. disk drives.

This is the first article in a three-part survey of users' attitudes toward alternative CPUs, distributed processing and IBM's Systems Network Architecture (SNA) by Jeffry Beeler, Ronald A. Frank and Molly Upton

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One of the benefits of switching to the Amdahl machine is that the DP center can continue to operate with IBM's MVT operating system. The 3033 would have required an immediate upgrade to MVS, but the Amdahl 470 will operate with MVT and give Ford the option of upgrading to MVS at any time, the spokesman said.

Hallmark Cards, Inc. in Kansas City, Mo., also has been looking at Amdahl CPUs as alternatives to its dual 168s, according to Ron Schmidt, senior technical services analyst.

The company evaluated an Amdahl 470V/6 against the IBM 168 and found the 470 had about 1.4 to 1.8 times the processing power at about 10% to 12% less money on a price-performance comparison, Schmidt said.

Performance and support of the Amdahl CPU appears to be equal to that provided by IBM, he added, but delivery advantages seem to be getting reduced because Amdahl deliveries are getting further out.

Comparisons with Itel processors were described as "less impressive." Control Data Corp.'s Omega systems were designed more for the smaller 370 systems, he added.

R.L. Babcock, information processing manager for the Joseph Schlitz Brewing Co., admitted that his company has toyed with the idea of replacing his company's 168 with an Amdahl machine (he doesn't remember the model number), but said the Milwaukee based firm has never seriously considered the option.

Because the brewer was on the verge of installing a new IBM 168 when it met with Amdahl representatives, Schlitz officials saw no point in taking the time and trouble to evaluate equipment. Instead, they merely discussed the financial pros and cons of replacing the IBM mainframe with Amdahl hardware, Babcock said.

Schlitz purchased its 168 very re-

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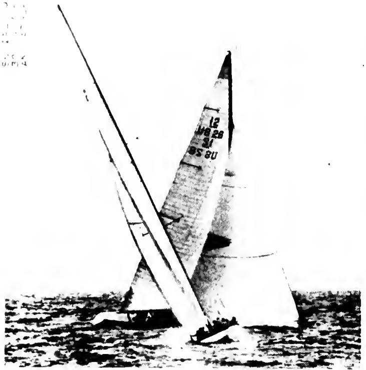

A computer is helping guide America's Cup defender Courageous, shown here (background, U.S. 26) opening a lead on challenger Australia last week.

Micro Challenges Tradition At America's Cup Races

By E. Drake Lundell Jr.
CW Staff

NEWPORT, R.I. — A century of sailing tradition is being challenged here during the 23rd America's Cup Challenge Races as an outsider gained the role of helmsman for the American defender Courageous and computers moved on board many of the contending yachts.

Ted Turner, who is sailing Courageous, clearly does not fit the image of the aristocratic gentleman yachtsman and in fact has been called the "mouth of the South" along the docks here.

Likewise, the computer system aboard Courageous that handles most of its navigation functions hardly fits the traditional image of a navigator clutching a compass in one hand and a pile of charts in the other.

But while the brash advertising executive from Atlanta may not set the style for future America's Cup helmsmen, the computers are clearly here to stay.

Of the two boats in the finals for the cup here this week, the Courageous is clearly the most computerized. 50% of the half-dozen original contenders, however, placed a great deal of reliance on computer systems.

The computer system aboard Courageous is based on an LSI-11 microprocessor from Digital Equipment Corp. and uses specially designed digital input units from Signet Instrument Co. and a hand-held terminal from Termiflex Corp., according to Bill Jorch, Courageous navigator.

Its competitor in the final best-of-seven series — the Australian yacht Australia — relies, on the other hand, on analog instrumentation and hand-held programmable calculators for its navigational duties, sources here said. The Australian challengers said they would rather not talk about equipment aboard the boat until the races end.

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Technology or Applications More Crucial to Growth?

By Edith Holmes
CW Staff

WASHINGTON, D.C. — Which is the greater driving force behind the growth of the computer industry — technological advances or applications development?

The answer is technology, according to Isaac Auerbach, president of Auerbach Publishers, Inc. of Pennsauken, N.J. Speaking at the Fifteenth Computer Society International Conference, Compcon 77, sponsored by the Institute of Electrical and Electronic Engineers here recently, Auerbach made special note of the promises and problems associated with memory technologies.

For Joe M. Henson, vice-president of market planning for IBM's Data Processing Division, however, "productivity in applications development is really the critical challenge that faces the industry and users alike" if meaningful growth is to continue.

Both Auerbach and Henson agreed that users haven't taken advantage of the available technology which has come about "faster than anyone expected."

But the technology which facilitates applications also makes their development more difficult, Henson added.

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In Antitrust Testimony

Witnesses Agree: IBM a Monopoly

By Catherine Arnst
CW Staff

NEW YORK — After two years of presenting evidence, the government is providing some conclusions to the court in the U.S. vs. IBM antitrust case The noteworthy point is that the conclusions of an industry observer who did not want to testify for the government closely paralleled those of the government's chief economic adviser for this lawsuit.

It is not surprising that Dr. Alan K. McAdams, a Cornell professor who has been working on this case since 1971, testified IBM erected significant barriers to entry to maintain its alleged monopoly position in the computer industry [CW, July 11, 18]. He helped prepare the pretrial brief and was naturally expected to make an anti-IBM analysis when he took the stand.

Observers were not so certain of the testimony of Frederic G. Withington, an Arthur D. Little, Inc. consultant who fought the government subpoena until the week before he appeared in court. One might have assumed that Withington, who testified after McAdams, would have been predisposed against the government's case. Instead, he may have been the Justice Department's best witness by substantiating McAdam's testimony [CW, Aug. 8, 22, 29].

Both men testified extensively on the subjects of market definitions and barriers to entry. With the first subject they were in almost complete agreement except for some semantic distinctions.

The computer mainframe market can be broken down into four subsections — scientific, general-purpose, small business and special-purpose computer systems, according to both men. The general-purpose computer system market is the largest subsection and IBM has 68% of that market, Withington said.

By dominating that market, IBM can control the other subsections as well as the plug-compatible peripherals market, testimony indicated. Users can utilize large general-purpose computer systems to do scientific applications, but scientific computers do not have the appropriate software to do business applications, thus limiting that market.

Because it dominates the largest subsection of the industry, IBM can also erect barriers that block entry into the entire industry, both Withington and McAdams testified. Both dwelled on "software lock-in" as one of the more substantial barriers to entry.

IBM initiated software lock-in with its first systems in the early '60s, thus tying users to IBM systems because a switch to another manufacturer's computer requires scrapping the existing programming. IBM had a large installed base at that time because of its substantial punch card business; once these users switched to IBM computers, they tended to stay there.

Analysis

This barrier to entry was cemented into place when IBM announced its 360 line, which promised a series of fully compatible systems, making it easy for users to upgrade from one IBM system to another.

Accordingly, for another manufacturer to effectively compete with IBM, it too must provide a full line of compatible systems, Withington asserted.

The competitor must also provide a large maintenance and support force with at least 100 regional offices, enough internal capital to support leasing and a line of plug-compatible peripherals broad enough to cover any type of application the user may want, Withington said. These are necessary because the industry giant has them and so established them as prerequisites for market entry.

Withington estimated the cost of entering the general-purpose market in 1977 would be $400 million.

McAdams, the economist, gave the theory behind Withington's observations. The test of a truly competitive market is the ease of both exit and entry, he testified.

If Withington's estimates were correct (and they were nearly identical to IBM estimates for market entry), then the market is monopolized, according to McAdams' criteria.

Only the largest and most well-established firms can even hope to successfully enter the computer market, he said. Even then, there is a good chance they won't succeed, as evidenced by the failures of General Electric, RCA, Singer and Xerox. These companies also proved the difficulty of exiting the market, as all suffered substantial losses by leaving.

A crucial element of McAdam's testimony was his observation that a monopolist has power over price and will raise or lower that price to contain competition, rather than to benefit the consumer. IBM always maintained a high profit margin for its products and, when it felt threatened by a competitor such as Memorex, would drop that price to the "Death Level," McAdams said.

"Death-level pricing" was the term used in an internal IBM document to describe the level to which a price can be lowered to cause a competitor to lose money if he tries to match it. The strategy was used time and again in the peripherals market, according to government charges.

Withington's description of IBM's pricing policies indicated he agreed with McAdam's view of the corporation's power over price. He insisted, even under intensive cross-examination, that IBM's motivation for lowering prices was to destroy competition.

The witness gave the same reason for most of the technological changes that IBM has developed, even though some of them have benefited the user.

As an example, he cited IBM's May announcement of its Model 3033 central processor, which he felt was obviously meant to stop competition from Amdahl Corp.'s 470V/6.

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Strong Executive Role Urged in New OTP

By Edith Holmes
CW Staff

WASHINGTON, D.C. — President Carter's plan to move the Office of Telecommunications Policy (OTP) out of the White House and into the Department of Commerce under a new assistant secretary provides a "unique" opportunity for the executive branch to develop a strong leadership role in communication and information policy, the Aspen Institute and industry members told Congress here recently.

Appearing before Rep. Jack Brooks' (D-Texas) House Subcommittee on National Security and Legislation, Glen O. Robinson, a special adviser to the institute, added, "We would be disheartened if this opportunity evaporated from neglect or timidity in providing a purposeful mandate to the new office of the Assistant Secretary for Communication and Information."

Robinson and Paul G. Zurkowski, president of the Information Industry Association (IIA), agreed with congressional and industry criticisms leveled at teh President's reorganization team in recent weeks for its failure to specify what responsibilities the new Assistant Commerce Secretary and his office will have [CW, Aug. 15].

"Our guiding premise is that the assistant secretary should have a clearly defined policymaking role, with a clear specification of his or her policy domain," Robinson said.

First, the new office, created by the merger of OTP and the Office of Telecommunications (OT), won't be able to attract the high-level talent it needs to infuse the communication and information area with "a competence and professionalism" so badly needed, Robinson said.

Second, without a clear mission statement, the office can't be organized well internally, he added.

Finally, and "possibly the most important failure of all," the office will suffer "the awkward and embarrassing inability to relate to the other executive agencies that deal with communication and information policy," he stated. Robinson predicted that in the absence of a well-defined role, the assistant secretary could never be the President's principal spokesperson in these fields.

Urged Rewrite Support

The Aspen Institute representative urged Brooks and his House Government Operations Subcommittee to support the rewrite of the executive and departmental orders — the two documents which define the authority the assistant secretary and his office will have.

During the hearing, Congressman Brooks strongly expressed his desire to leave these orders alone.

Brooks suggested the executive branch "might write in all kinds of duties I won't agree with" if it is allowed to revise the orders. "I'm very cautious about executive orders," he added.

Arguing that there is no legal requirement to retain the present Executive Order 11556 which defines OTP's duties, Robinson said the departmental order is really the key to the new office's success.

Calling the new office the "National Communications Agency," for want of another name, he suggested its communication and information arms would be on a par with each other. The new agency would be responsible for formulating domestic communication and information policy relating in the private and public sectors.

The Commerce Department agency would also be in charge of setting international communications and information policy, under the Aspen scheme. This would include policies involving the industry structure and performance of the U.S. international communication carriers.

Policy formulation in the area of exports and imports of information and communication technologies and services and their domestic and foreign social and economic impacts would be still another field within the agency's realm of responsibility, Robinson said.

The Aspen Institute would have the national communications agency conduct a research program on the characteristics and uses of communication and information technologies and resources. The agency would also support the federal agencies in their procurement, system planning and implementation of these technologies, Robinson stated.

The new agency would be in a position to recommend to the Office of Management and Budget (OMB) policies for the procurement of communication and information technologies and services, he added. It would also be charged with the coordination of plans and programs to mobilize the nation's public and private communications and information resources in the event of a national emergency.

Like Robinson, Zurkowski of the IIA supported the opportunity for change provided by the reorganization of OTP and the creation of the new Assistant Commerce Secretary.

The new assistant secretary should have a deputy for information policy, Zurkowski stated. In addition, some of the computer policy roles of the Office of Science and Technology in the Commerce Department should be delegated to the new office as well, reflecting the overlap between these technologies, he added.

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"It would be very difficult to take ROSCOE away now . . . ," Life of Georgia Technical Analyst, Earl Ryan, speaking about ADR's on-line conversational programming system.

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Large IBM Users Browsing But Not Buying Alternatives

(Continued from Page 1)

cently, company officals are not inclined at this point to seriously consider installing an IBM replacement.

William Shine, senior vice-president of the Chase Manhattan Trust Department in New York, said his bank has considered both Amdahl and, Itel machines as replacements for its 168. But, he added, the bank has decided against those alternatives.

The alternatives might have more appeal for the bank if they were intended for internal applications only. Unfortunately, the current computer system is for customer service applications, so the reliability of that system — or any replacement — is paramount, he explained.

Shine also expressed concern about the replacements' software. Theoretically, he said, the Amdahl and Itel software is interchangeable with IBM's, but in practice there are inconsistencies.

Sticking With IBM

Bill Fore, manager of the technical staff group for Sun Information Services in Dallas, said his firm looked at Amdahl's 470V/6 about a year ago, but decided on a 370/168 instead.

Sun stayed with IBM, he said, because there was a question of service with the Amdahl unit. Further, Sun got a good financial deal, so the difference in cost between a 168 on a long-term lease and the 470 "didn't seem to warrant the exposure and risk," Fore said.

In addition, Sun was running flat out; the company was in a transition period and didn't have software people to spare should the Amdahl need some special attention, he said.

Ralston Purina Co. in St. Louis didn't really consider Amdahl or other IBM alternatives because it got very good delivery dates on the two 3033s it ordered, according to Chuck Childers, general manager of computer services.

The IBM machines are due in September and December of 1978, he said, and the firm is investigating a package deal which would involve subleasing the 168 and 158 it has from Itel and arranging a long-term lease on the 3033s.

Ralston Purina has had IBM CPUs since 1966, although it has gone to other vendors for nearly everything else, including about 300 Univac Uniscope terminals which it links with IBM's IMS through its own teleprocessing program.

The firm has converted to MVS, according to Childers, who praised such capabilities of the system as resource management, more than 15 initiations and more concurrent jobs, as well as the ability to use new IBM peripherals.

But using MVS is also "a matter of keeping pace," Childers said. IBM plans to drop support on MVT.

With MVS, the firm has discovered some application program dropout. Although MVT tolerated various deviations from specifications in the, programs, MVS didn't, he said.

Wavering on 470

Jeff Dunn, assistant DP director of Northwestern Mutual Life Insurance in Milwaukee, said his firm has considered replacing its 168 with an Amdahl 470V/6-II. In fact, the company already has placed an order for the Amdahl machine, but Dunn and his colleagues have not yet decided whether to confirm the order.

Dunn cited improved delivery as one reason Northwestern is considering replacing its IBM mainframe. If they confirmed the Amdahl order, company officials could expect delivery by the third quarter of next year.

Goodyear Tire and Rubber Co. in Akron, Ohio looked "lightly" at Amdahl's 470V/6, but made no decision to go with it. At the time Goodyear was looking, Amdahl had only about 30 installations, many of which were in university and government environments, according to John Longstreth, manager of DP support services.

The firm has no plans to reconsider Amdahl at this time, he said.

Monsanto Co. in St. Louis has looked at Amdahl's V6 and V7, but not really seriously because management has not indicated a desire to go outside of IBM for equipment, according to Frank X. Fallert, manager of performance analysis.

Monsanto has gotten as far as recognizing the existence of Amdahl, he added.

Firestone Tire & Rubber Co. has flirted briefly with the idea of installing an IBM replacement, according to the company's operations manager, H.W. Guthrie. But the Akron, Ohio firm never seriously followed through with the hardware installation.

Guthrie said Firestone's central computer system incorporates hardware from IBM competitors like Itel, so to dismiss Firestone's DP department as an all-IBM shop would be misleading. When it comes to CPUs, however, the company likes to avoid mixing equipment, the manager explained.

Firestone evaluated Amdahl equipment as a replacement for its IBM 158, but Guthrie said he didn't remember the model number of the potential alternative.

Leo Harris, operations manager for Blue Cross/Blue Shield in Richmond, Va., said that firm "briefly" considered replacing its IBM 158 with an Amdahl 470V/5 or 470V/6, but eventually decided against the switch.

Harris described his firm as "very conservative" and admitted company officials had expressed some concern about Amdahl's long-term viability. "Amdahl is still essentially a one-product company," Harris said.

If Amdahl gains a larger market saturation and wider product line, Blue Cross/Blue Shield would feel more confident about its long-term survival prospects, he added.

PPG Industries, Inc. has not seriously considered replacing its three IBM 158s with Amdahl, Itel or CDC hardware, according to D.L. Campbell, director of the company's computer center.

PPG is very conversative in its organization and corporate policy, Campbell explained, and has already committed itself strongly to IBM equipment. This commitment sometimes causes problems for the company, but it has the advantage of being safe, he said.

Ashland Oil in Ashland, Ky., is considering an Amdahl 470V/6, but Stan Wonn, administrative assistant for computer science and services, said the firm is a heavy IBM user.

Ronald Leone, data center manager for Sears Roebuck Co. in Philadelphia, said Sears has "tinkered with the idea" of replacing the firm's 158 with one of the IBM alternatives, but "has done nothing serious" about the matter. He doesn't know which of the alternatives the company has evaluated because most of the decision concerning computer equipment selection are made at Sear's Chicago headquarters.

Amoco Production Co. has considered replacing its IBM 168 with an Amdahl 470V/6 CPU, but the firm has not yet decided whether it will make the equipment switch, operations manager William Caldwell said.

Because Amoco is still in the early stages of evaluating the IBM replacement, it is unable to say at the moment what the potential advantages and disadvantages of the Amdahl hardware are.

No Switch Considered

J.C. Penney Co. has not considered switching to the IBM replacements because the Wauwatosa, Wis.-based firm wants to avoid the problems that arise from having too many different kinds of equipment at the same site. Penney already uses IBM peripherals at the Wauwatosa data center.

Nor has Oscar Mayer Co. considered switching from its 158 to the IBM replacements, according to Roger Tietz, the company's computer manager. The Madison, Wis.-based firm considers itself an IBM shop and plans to maintain that status for some time to come, Tietz explained.

But Prudential Insurance Co. of America in Roseland, N.J., not only evaluated the Amdahl 470V/6, but installed one in addition to its 370/168 about eight months ago, according to Mike Capo, shift supervisor.

The 470V/6 was selected for teleprocessing duties because it was faster than a 168, John Richards, system programmer, indicated.

"Overall we've been very impressed with it," Richards said. Capo noted the system had been subject to some downtime, but said it does the work of a 168.

R.N. Wehling, technical services manager of Alcoa Aluminum in Pittsburgh, Pa., said his company has not considered replacing its 158 with any of the IBM alternatives. He said the firm already owns its mainframe and plans to use it for a while.

Bud Patterson, production manager of Union Carbide's Chemical Division in South Charleston, W. Va., refused to disclose whether his company has considered replacing its 168 with IBM alternatives. He said that information is confidential.

Comment Deadline Extension Delays Computer Inquiry Again

WASHINGTON, D.C. — The Federal Communication Commission's (FCC) second Computer Inquiry has been stalled a second time.

The latest delay to the year-old inquiry into the definition of data processing and potential DP service offerings by common carriers occurred when IBM requested the date for filing reply comments be extended from Sept. 12 to Oct. 14.

The initial holdup of the comment portion of the Inquiry came when AT&T asked for a 90-day delay of the due date for participation — from July 25 to Sept. 12.

In both cases, the corporation involved is preparing a study to accompany its comments as an appendix. IBM's "expert study" will be on "the effects of public utility regulation in a competitive environment," the corporation told the FCC.

Because they had already granted an extension of time for AT&T, the FCC comissioners felt they could do no less for IBM and thus moved up the deadline for filing reply comments to Monday, Oct. 17.

Some 80 participants in the Inquiry submitted comments on the FCC's proposed definition of Data processing last June 6 [CW, June 13]. The reply comments represent the second round of participation by users, trade associations and industry members.

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Bell's Remark Stirs Debate

Congress Eyed as Right AT&T Antitrust Forum

By Ronald A. Frank
And Edith Holmes
CW Staff

WASHINGTON, D.C. — A recent suggestion that the AT&T antitrust trial should be decided by Congress instead of the courts has drawn opposition statements from several communications organizations.

The suggestion was made by U.S. Attorney General Griffin Bell in an interview with *Fortune* magazine in which Bell said the AT&T suit should be handled by Congress.

Several organizations, including the Independent Data Communications Manufacturers Association, the North American Telephone Association and Phonetele, Inc., have taken issue with Bell, while AT&T has registered its general approval.

The attorney general has proposed on several occasions — most recently in the *Fortune* interview, scheduled for publication in November, that big antitrust cases involving a restructuring of an economic system "would perhaps be better . . . done by Congress than by a single federal judge."

The final judgment, the attorney general acknowledged, would be political. But why not, when most economic decisions on behalf of the U.S. are politically based? he asked.

Interest Waning?

A Justice Department spokesman, contacted for clarification of Bell's remarks, denied Bell's remarks signal the department's interest in the case is waning.

"We are committed to trying the AT&T case in court. Bell and John Shenefield [acting assistant attorney general] are doing everything possible to expedite the case," he said.

"Bell has no intention whatsoever of taking AT&T to Congress," the spokesman added.

Bell simply used the AT&T case as an example of the kind of antitrust suit so closely involved with economic and social issues that might be settled by Congress in the future, the spokesman explained.

A spokesman for the IDCMA said, "The attorney general has apparently admitted that the antitrust laws are unworkable — at least when a very large organization like AT&T is involved."

If the attorney general simply intends to abandon the AT&T suit, his action may be interpreted as a concession to monopoly and an admission that the U.S. is powerless to do anything about it under existing laws, the spokesman said.

The North American Telephone Association (Nata), an organization of companies that compete with the telephone company, issued a statement which said that Bell "apparently based his statements on the belief that the suit with appeals will take 10 to 15 years to settle.

"Bell's statements indicate a very dangerous situation. The Justice Department has a clear mandate under the antitrust statutes of this country to prosecute any company involved in restraints of trade. Furthermore, Congress should not be asked to reaffirm its clearly established procompetitive principles on a case by case basis," Nata said.

In a speech delivered at the annual Nata convention in Washington, D.C., Sen. Gary Hart (D-Col.) said Bell's remarks could signal the state of a debate on the proper role of Congress, the executive branch and the judicial branch in promoting free market principles.

"The attorney general suggested that Congress may be the better forum for reaching what he termed "political judgments." This strikes me as an oversimplified explanation of what is wrong with our current methods of antitrust enforcement," Hart said.

"I am not sure Congress is a better forum than the courts for resolving the AT&T case. That case involves not only political judgments, but also alleged predatory and anticompetitive practices, which have precise judicial and legislative definitions," he said.

A more favorable comment on Bell's opinions was made by AT&T board chairman John deButts. Appearing on a recent ABC "Issues and Answers" program, deButts told an interviewer: "When you get into organizational structure of an industry, it is beyond the antitrust laws and their purpose. If you're breaking the law, you should be penalized and should have to pay a fine or maybe even go to jail.

"But from the standpoint of the total society, the reorganization of the structure of an industry goes beyond that and maybe the decision should be made by the Congress of the United States. And with that philosophy I agree."

As a result of Bell's comments, a letter was sent to the attorney general by Robert Feiner, president of Phonetele, Inc.

In it, Feiner told Bell that "If you intend to refer any issues contained in your suit against [AT&T] to the Congress, then I believe it is now incumbent upon the Justice Department to investigate precisely how obligated each member of Congress may be to AT&T, et al."

Bell's statement "served no useful purpose to anyone but AT&T by fortifying its efforts in Congress."

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Technology or Applications More Crucial?

(Continued from Page 1)

"Computer technology has extended our applications horizons but those horizons are harder to achieve," he said. Techniques developed to reduce the problem of implementing applications such as interactive programming systems and program generators aren't being used to the extent they should be, according to Henson.

The IBM executive predicted that future developments in the area of applications will be "evolutionary." The industry won't see any "breakthroughs" in this field, he stated.

'More Profound' Results

While Henson applauded technological advances, he suggested that improvements in equipment price/performance ratios should result in more than the same job accomplished faster. Advancements in technology should permit "more profound things," he maintained.

Many applications include non-DP people whose part in the system is essential to its operation and so must be clearly understood, Henson said. There is a "user thrust toward operational systems" as a result, he noted.

Henson identified another class of applications — those involving technical and management forecasting modeling, end-use design and other planning functions. Both the operational and the planning applications demand more data, which often means a need for large data base systems. These systems add to the difficulty of developing the applications themselves, he said.

The problems presented by data bases, go hand in hand with those attendant with price/performance improvement in graphics and communications, Henson suggested. These technologies may have all kinds of potential uses, but their development into applications might cost more than the user can afford.

There are other problems which accompany technological advances as well. Among them are system security, auditing and privacy, he said.

The tools needed to simplify the development of applications are available but aren't used, Henson stressed. Virtual memory, preprogrammed telecommunication controllers, chief programmer teams and structured programming are among the aides at the users disposal if he would only employ them, Henson sid. Of all IBM system users, only one in seven uses interactive programming capabilities to solve problems, he noted.

Application program report generators can reduce by two-thirds the number of code steps required in a program and yet they aren't used. Instead, users continue to let an average of 85% of their programming costs be tied up in maintaining this software, Henson suggested.

The problem of efficient applications development "is serious' and "a major inhibitor to all computer users and thus to economic growth," he said.

On the other hand, the application of tools in program development should be dictated by economics, he added. "It costs more to develop and debug applications than to run them for their lifetime," Henson said, noting that 46% of IBM's programs require 2% of its computer capacity.

"It doesn't make sense to spend resources on fine tuning systems given the cost of the software development to be accomplished on them," he said.

Henson concluded that any progress in the area of applications development and hence in the growth of computing must come thorough discipline rather than breakthroughs. Programming is not an art "so individualized that it cannot be broadly controlled," Henson stressed. It must be viewed as a "pragmatic discipline" requiring a "good allocation" of resources, he added.

Henson looks to the mid-1980's and the development of automatic programming to assist the development of applications.

Auerbach suggested growth in the use of computers will stem from lower costs resulting from technological developments chiefly in the area of memories. He believes that in the next few years, users will see the cost of their processing power and internal memories diminish by one-third as the industry reaches the point at which more than a million circuits can be packed onto a chip.

The user cost of processing power and disks will go down two-thirds because of the increased densities of information that will be recorded, he predicted.

Read-only memory (ROM) promises to make the use of firmware more widespread, Auerbach said, adding that he expects the cost of reprogramming to decrease, given electrically programmable ROMs now being developed.

Both charge-coupled devices (CCDs) and bubble memories will depend on how suitable the programming is that accomplishes them, Auerbach stated. These techniques must be shown to be competitive with moving-head disk memory, he added.

And Auerbach predicted that "significant improvements" are still accessible in moving memory technology in the areas of bit density, track density and access time.

Micro Challenges Tradition By Taking to the High Seas

(Continued from Page 1)

The Courageous system is working "pretty well," Jorch said, adding there has been "no downtime" because of the CPU even though some downtime was experienced early in the trials because of problems with the power supply, which is fed by two automotive batteries.

Admitting that Turner was initially "very negative" about the computer system, Jorch said the helmsman is "still not in love with it" since he's a "seat-of-the-pants sailor."

However, Turner has come to accept the system because it proved its worth and reliability during the grueling summer of trials for the cup, Jorch said. "He panics a little" now if the system fails to work or an instrument goes out.

Jorch, on the other hand, is very comfortable with computer systems since he is a senior engineer in computer equipment design for Grumman Aerospace Corp. when not sailing.

In one example of the system's value, Jorch said that in an early race the power went down — and Courageous lost 20% of the lead it had gained at that point, even though it went on to win the race.

The system basically provides the navigator with position and speed information, including readouts on wind direction and speed, speed through the water and position on the course.

Previously all of these things had to be hand calculated by the navigator, taking up almost all of his time and providing less accurate information.

For example, even what would seem to be a relatively simple calculation — speed — is difficult in choppy seas aboard a 12-meter yacht. Each wave either boosts or slows the speed of the boat to some degree; with manual systems, the navigator has to use his judgement to try to determine the exact speed of the boat on the course.

The computer system, however, is constantly measuring the speed and calculating the averages, giving a more accurate readout, Jorch said.

Wind direction is another complex calculation handled by the system. About 60% of an America's Cup race is sailed into the wind with the boats tacking toward a mark.

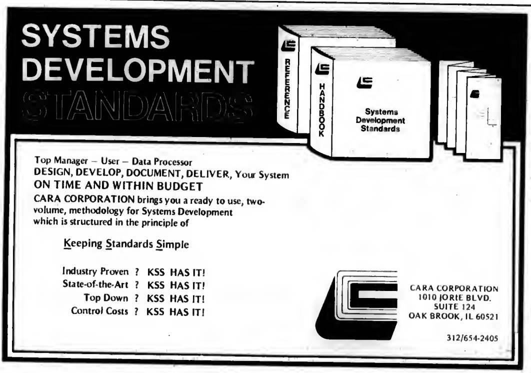
There is an optimum angle that each boat can sail toward the wind. If the boat tries to sail closer than that angle, its speed slows; if it sails at a wider angle, it may actually go faster, but have a longer distance to the mark.

It is therefore extremely important for the navigator and helmsman to know the "true" wind direction at all times.

The computer system computes the boat angle and speed and adjusts for these in order to give the navigator a readout of the true wind direction, Jorch said.

Although computers are being used more widely here this year than ever before — with the Swedish yacht Sverige and another American contender, Independence, sporting computer systems, almost identical to the one on board Courageous — they have played a minor role in past races.

Beginning in 1970, attempts were made to use rather primitive analog computers for wind direction calculations, Jorch said, and in the 1974 series a Data General Corp. Nova system was installed aboard Courageous, which was the American boat then also.



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After 'Unfair Treatment' Charges

State Picks New Group to Weigh Medicaid Bids

By Ann Dooley
CW Staff

BOSTON — A new selection committee has been chosen to evaluate bids for a state Medicaid system because the previous choice was disqualified after other bidders charged they were treated unfairly during the original selection process.

Blue Cross/Blue Shield of Massachusetts was originally awarded the $19 million contract with a subcontract to Electronic Data Systems, Inc. (EDS). When other bidders complained of "unfair treatment," a review board was established to examine the selection process [CW, Aug. 8].

The board determined that some of the complaints were valid and recommended that Gov. Michael S. Dukakis reopen the bidding.

The new selection committee, is already beginning work, according to chairman William O'Connor, assistant secretary of the Department of Administration and Finance (A&F). The other four members of the board are state employees, contrary to the hopes of some critics who felt members of the private sector should be included in the selection process this time.

Bidders Try Again

According to O'Connor, four of the five original bidders are bidding again — Blue Cross/Blue Shield; Pilgrim Health Applications, a subsidiary of Arthur D. Little, Inc.; Planning Research Corp. and System Development Corp.

Only Citibank is not trying a second time.

The committee, which acts in an advisory capacity to the Secretary of A&F, will probably not have an opinion ready for several months, O'Connor said.

Rebidding procedures are moving slower in another controversial state contract, that one involving a $23 million facilities management contract almost awarded to EDS [CW, Aug. 15].

The A&F contract was halted when the State Attorney General disclosed conflict of interest between EDS and Sci-Tek Associates. Two members of the selection board that awarded the job to EDS were also employees of Sci-Tek, a firm involved with EDS in a Tennessee contract.

The companies wishing to bid again on that contract must wait for a new selection committee to be formed. But the formation of that committee hinges upon what a conflict-of-interest investigation by the Attorney General may reveal.

The investigation is expected to continue for several more weeks.

EDS has stated it did nothing wrong in working in a joint business relationship with Sci-Tek. EDS said it had questioned Sci-Tek on the propriety of their arrangement before entering into the relationship, officials said, and Sci-Tek checked with the state and was told there would be no problem.

Relationship Okayed

The relationship between Sci-Tek and EDS on the contract in Tennessee had been approved by the state before EDS had entered its bid, John Buckley, A&F secretary, admitted.

Because the award of the Massachusetts contract was delayed, the two contracts were being negotiated at the same time and that plays a large part in the conflict-of-interest charge, Sci-Tek officials claimed.

Backus Receives Turing Award

NEW YORK — The Association for Computing Machinery (ACM) recently named John Backus the recipient of the organization's 1977 Turing Award.

Backus, an IBM Fellow at the Research Center in San Jose, Calif., was selected for his "profound, influential and lasting contributions to the design of practical high-level programming systems, notably through his work on Fortran," the award committee said.

The $2,000 award is ACM's most prestigious award for technical contributions to the computing community.

Development of Fortran

Backus headed a small IBM group in New York City during the early 1950s that developed "a high-level language for scientific and technical computations called Fortran," ACM continued. The group also translated the programs into machine language using "novel optimizing techniques" to generate fast machine language programs.

The award recipient also served on the international committees that developed Algol 58 and Algol 60, a later version. Algol received "broad acceptance in Europe as a means for developing programs and as a formal means of publishing the algorithms on which the programs are based," ACM continued.

Backus' present work concentrates on the foundations of programming languages in order to understand the simplest elements needed to build a programming language.

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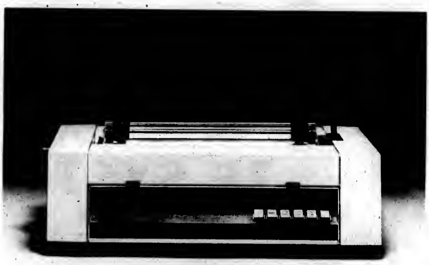

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To Integrate Budgets, Accounting

Financial System to Straighten N.Y.'s Books

By Catherine Arnst
CW Staff

NEW YORK — New York's financial crisis of the past two years finally forced the city to design its first centralized financial management system, although the suggestion for one had been made at least two years earlier.

Jan Lodal, executive vice-president of American Management Systems, Inc. (AMS), designer of the system, had worked on New York's payroll system prior to the fiscal crisis in 1975 and had written studies suggesting an integrated centralized system.

When state and federal laws connected to the city's financial rescue required such a system be built, AMS was contacted again because "those studies proved right," Lodal said.

After 18 months of design and development, New York's Integrated Financial Management System (IFMS) was installed by AMS July 1.

IFMS will integrate the city's budget and accounting applications for all its agencies and the end result should be auditable financial statements for the fiscal year ending June 30, 1978.

The system runs on two IBM 370/158s and there are about 200 Genesis One G77 CRT terminals tied into the system, which allow agencies to retrieve information but not alter or input any data. All data is currently entered in a batch mode on 35 IBM 3277 terminals in a central location. Eventually, some data will be remotely entered, Lodal said.

6 Billion Bytes Storage

The system currently has 6 billion bytes of direct access storage available which will be expanded to a maximum of 12 billion. The system costs $16 million and is budgeted to operate at a cost of $10 million annually.

Prior to IFMS, New York's only automated financial systems were its budget, accounting and payroll systems. However, these were not integrated, according to Steven Clifford, special deputy comptroller. "There were a whole bunch of important functions that weren't being done," he added.

In December 1975, a report by Arthur Andersen & Co. highlighted some of the weaknesses in those systems. Among those cited were: lack of controls in the overall accounting systems and procedures; fund control structures that were not useful for control of revenues, expenditures and fund balance; expenses for contracts that were not recognized until vouchers were processed.

In addition, bank balances were not reconciled for several years and information on cash balances maintained by the comptroller and the director of finance differed by several million dollars.

One of the city's problems was that the comptroller and the mayor "were usually at each other's throats," Clifford said. To overcome that lack of cooperation, the Financial Information Services Agency (Fisa) — which is equally controlled by the comptroller and the mayor — was set up to administer the new system.

AMS was chosen to develop the system because Clifford had worked with it before and believed its personnel to be "the only people who could handle the job." City personnel and accountants from Touche Ross and Co. worked with AMS on the design.

Strapped for Time

"Our biggest problem was too little time," Lodal said. The systems contract was issued in September 1975 and the system had to be installed by July 1, 1977. That deadline was established by federal law.

"Almost nothing could be salvaged" from the existing systems and the city's accounting data was not in a standardized form. The city also never kept any inventory records of fixed assets, he added.

There was no time to accommodate the special needs of the different city agencies, Lodal said. Clifford described the system as a "top-down design. It had to be, with only 18 months to deliver.

"There was not as much input from agencies as would be expected. I wish the agencies had been more concerned," Clifford said. The result has been "numerous clerical problems and some grumbling, but I haven't paid any attention."

The system did start on schedule with only the usual start-up problems, Clifford said.

"As a big on-line system it's certainly not systems state-of-the-art — we had no time to be daring. But we do think it is applications state-of-the-art," Lodal said.

He added that no other city has a financial system of such size and flexibility, but "New York needs the best and fanciest because of its size."

The system issues about 200 reports, through an automated report distribution system, to about 2,000 separate user groups, allowing agencies for the first time to analyze their own financial data, Clifford said.

The programming is done in Cobol and operates under an information management system (IMS) which gives it great flexibility, Lodal said. Everything in the system is controlled by master tables which are core-resident but available to the system. This makes it very easy to use.

Afips Updates 1973 U.S. DP Summary

WASHINGTON, D.C. — Computer technology is a "nonscarce" national resource that is relevant to a broad range of policy questions, according to an American Federation of Information Processing Societies (Afips) study which is scheduled for release in October.

Updating a 1973 report by Afips, *Information Processing in the United States: A Quantitative Summary* estimates that the total computer labor force is 853,000 people.

While the insurance and banking industries have the largest number of firms using computer equipment or services, the manufacturing sector is the biggest computer user in the U.S. in terms of the amount spent on equipment and services, the Afips study found.

The report, which has already been presented to the White House Office of Science and Technology Policy, predicts that U.S. firms' world computer manufacturing and services revenues will double from $31.9 billion in 1976 to $64.0 billion in 1981.

Meanwhile, world computer equipment shipments for U.S. companies will also double from $15.9 billion in 1976 to $30.5 billion in 1981, Afips said.

Finally, the study shows that while the percentage of gross national product spent on computer usage in the U.S. is increasing dramatically, the amount spent per capita is increasing at an even faster rate.

The 85-page report updates the previous Afips study, entitled *The State of the Computer Industry in the United States.*

Intended to provide summary data on the information processing field, the report will be publicly available next month from Afips headquarters at 210 Summit Ave., Montvale, N.J., for $6.00 per copy.

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Programming Called 'Natural' Field for Blind

By Mary Kincaid
Special to CW

"Computer programming is a natural field for blind students to enter," according to Joyce Van Tuyl, a California transcriber whose braille transcriptions have launched a number of blind students into advanced math careers.

Van Tuyl, along with a band of other volunteers, has been a member of the California Sixth District State PTA Braille Transcription Project since 1968. A graduate of the University of Michigan College of Engineering, her sympathies lie with the thousands of gifted, intelligent blind young people who are inclined toward math and science. This is a group often turned away from their field of interest by counselors, who themselves may find math and science "impossibly difficult" and, therefore, unappealing.

Van Tuyl, who is fully sighted, signed up for the first adult education class in braille offered in Palo Alto in 1956. It was a providential choice. The tasks involved were intellectually stimulating and rewarding, and the need for trained personnel to learn the alphabet and the technique of transcribing it by machine was urgent.

15% Know Braille

Although braille transcriptions enable the blind to read textbooks, enrich their lives by reading the world's best literature, or follow new recipes from gourmet cookbooks, only 15% of the blind population knows how to read braille.

There are several reasons for this surprising statistic. Those who become blind as adults are often defeated by the enormity of their misfortune. They simply don't have the will to try to learn. On the other hand, the optimists don't want to learn because they believe their blindness is temporary.

In addition, many blind people are diabetic. They often have a reduction of the sensation of touch, preventing them from using their fingertips quickly to sense the pattern of raised dots that form the braille alphabet and other braille symbols.

During the '50s, better braille code was designed for math. The old math symbols, with positions both above and below line, and the incorporation of several foreign alphabets had prevented transcribers from using them in the rigidly coded single-line braille system used for text.

In 1952, Dr. Abraham Nemeth, now a mathematics professor at the University of Detroit, devised a way to adapt the existing braille system to incorporate modern math symbols.

Logical Link

"Computer programming," Van Tuyl said, "is a natural field for intelligent blind students, because from childhood on they have had to organize and systematize every aspect of their lives: Socks, kitchen utensils and furniture are all placed in specific places for ordered and efficient use. This is exactly the systemized procedure in which computer programmers must be trained to think. That practice sometimes even puts them ahead of sighted programming students."

A number of young Californians for whom Van Tuyl had transcribed textbooks have grown up and gone on to study advanced math. One boy received his BA in math at Stanford University, then took a Masters in operational research. Another of her students is now doing graduate work in computer science at Georgia Tech.

The Braille Transcription Project, sponsored by the Sixth District California State PTA, has been in operation for 21 years, not only training volunteers in transcription, but also in recording texts on tape.

Before a transcription is begun, a search is made with the American Printing House for the Blind, in Louisville, Ky., to see whether the requested text is already available. If not, a volunteer is assigned to the task.

Volunteers work at home on small machines that transform printed words into the raised dot patterns on paper. If that material is to be made into a book, these pages are duplicated a second time on more durable plastic sheets that will withstand the pressure of the readers' fingertips for a longer time.

Understandably, more pages and more labor hours per page are required to produce a book in braille than in print. The Transcription Project has produced such time-consuming volumes as Roget's *Thesaurus*, that in braille requires 45 volumes. A special system is used to transcribe music.

The project receives no funds from any governmental source. The thousands of hours per book are donated entirely by volunteers except for the paid work done by the blind proofreaders.

The Education for All Handicapped Children Act, passed in 1975, grants all children the right to a free public education. The federal government will now underwrite only 5% of these costs, but by 1982 will supply 40%. In the meantime, volunteers are needed.

Those interested in contributing to the cause may write to the National Braille Association, 85 Godwin Ave., Midland Park, N.J. 07432, or to the California Transcribers and Educators of the Visually Handicapped. Gifts and Tributes Chairperson for the latter is Margaret Parenty, 1103 Ortega Rd., Pebble Beach, Calif. 93953.

Kincaid is a freelance writer from Ann Arbor, Mich.

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Photos by Steve Stibbens

Drive-in teller uses a terminal from Signature Technology, Inc. of Dallas to verify signature.

CRTs Help Drive-In Tellers Catch Forgers Red-Handed

LAKEWOOD, Colo. — Signature verification terminals in use by tellers at Jefferson Bank & Trust here are reportedly proving their worth in stopping forgers.

In the first four months after 52 Informer, Inc. Model 301 terminals were installed, Jefferson Bank's drive-in tellers caught three forgers red-handed, according to Sam Blackman, vice-president of customer operations.

When the tellers saw that signatures on checks averaging $600 each failed to match up with the authorized signature displayed on their mini CRT, they questioned the forgers.

Foiled in their attempt, the forgers sped off — but not before tellers copied their license numbers.

The tellers kept the bad checks and the bank's money. Police got the forgers.

Teller in lobby calls up a signature from the bank computer's disk files for display on a 6-in. CRT.

On-Line System Saves Lawyers Research Time

SAN DIEGO, Calif. — Law students and lawyers here can now save an estimated 70% in research time using Westlaw, a computer system that provides a list of past court cases on almost any subject.

Installed at Western State University College of Law about a year and a half ago, the computer facility communicates via an IBM 3275 CRT on-line to an IBM 370/158 located at the national Westlaw system in St. Paul, Minn.

The system contains summaries of every reported decision since 1967 for all state courts and from as far back as 1961 for all federal courts, according to James O. Werner, law librarian.

Westlaw retrieves information in summary form when an inquiry is keyed into the system and can save as much as a day of examining law reference books, Werner said.

The response to the system has been very enthusiastic, Finz said. People who have a prejudice against computers would change their minds once they tried the system, he said.

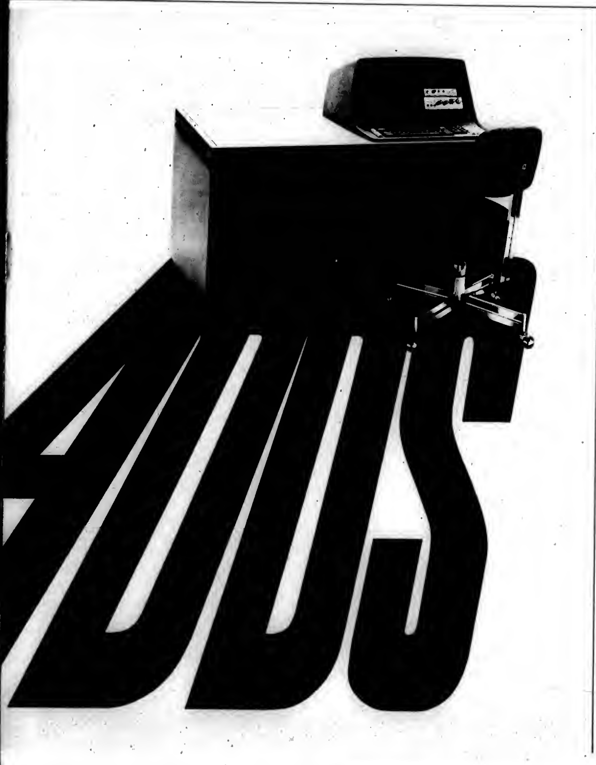
Westlaw is supplied by West Publishing Co. of St. Paul.

Liu, Ghosh to Take NCC Program Posts

MONTVALE, N.J. — Dr. Leonard Y. Liu, manager of the Computer Science Department at IBM's San Jose Research Laboratory, has been named chairman of the 1978 National Computer Conference (NCC) professional program. He will be responsible for the overall planning and implementation of the conference, to be held June 5-8 at Anaheim, Calif.

Dr. Sakti P. Ghosh, research staff member at the laboratory, has been appointed program vice-chairman.

The 1978 NCC is sponsored by the American Federation of Information Processing Societies, Inc. (Afip). Further information can be obtained by writing NCC '78, c/o Afips, 210 Summit Ave., Montvale, N.J. 07645.



Editing System Expected to Save House $2 Million in Printing Bills

By Edith Holmes
CW Staff

WASHINGTON, D.C. — The U.S. House of Representatives estimates it will save over $2 million in printing legislative bills this year as a result of an electronic publishing system installed in April.

Operated by the House of Representatives Information Systems (HRIS) staff as a joint venture with the Committee Reporters' Office, the Committee on House Administration, several House committees and the Government Printing Office (GPO), the system is intended to cut the cost and time involved in converting hearings and committee reports to print.

After three months of limited operation, HRIS determined it had already saved the cost — $638,200 — of the Atex, Inc. CRT terminal-oriented composition and editing system, a spokesman said.

Using a Digital Equipment Corp. PDP-11 minicomputer to capture, edit and print transcripts, the system has reduced the average time required for printing hearings from more than three months to less than 20 days.

For example, the system made it possible for the House Ad Hoc Committee on Energy to print its June hearings within four working days after they were held, the Committee on House Administration reported.

The GPO can actually produce the original page copy for printing the same day a hearing is held, the spokesman noted.

Used by 19 House committees to prepare more than 250 transcripts and print more than 30 documents, at midsummer the Atex system resulted in a direct savings to taxpayers of $73.62 for each page that was composed electronically. The old hot-metal method of composing text costs $76.86 per page, while the new approach has averaged only $3.24 per page so far, including House and GPO personnel, labor and material costs, the GPO found.

The House figured it had to print a total of 8,669 pages before the equipment was paid for and real savings were received. As of July 15, the House had 8,664 pages ready for typesetting, the spokesman said.

The spokesman noted that the system has unexpectedly provided savings in another area as well: it has increased the speed and efficiency of the Committee Reporters' Office. The terminals have enabled more committee reporters to cover more hearings.

The House has not had to spend approximately $100,000 on commercial reporting services since the system has been in operation as a result of this increased reporter efficiency, the spokesman said.

Kit Offers Tips For Job Hunters

PALO ALTO, Calif. — ETC Business Services is offering a resume kit to professionals seeking jobs.

It contains a form with complete instructions for writing an effective resume, sample resumes, an article, "Guide to Professional Employment," and instructions for interview preparation.

The kit costs $5 from ETC Business Services at 484 Lytton Ave., Palo Alto, Calif. 94301.

Calendar

Oct. 6-7, Washington, D.C. — **Humanized Technology for EDP Management** by Tom Gilb. Also being held Oct. 10-11, Chicago; Oct. 13-14, Toronto; Oct. 20-21, Seattle; Oct. 24-25, San Francisco; Oct. 27-28 Houston. Contact: TSI Sales and Marketing, Inc., 19 W 44th St., New York, N.Y. 10036.

Oct. 6-8, Tokyo — **International Conference on Very Large Data Bases**. Contact: Prof. Stuart E. Madnick, Conference Chairman, Center for Information Systems Research, Alfred P. Sloan, School of Management, Room E53-333, MIT, 50 Memorial Drive, Cambridge, Mass. 02139.

Oct. 9-12, Boston — **Common Fall Conference**. Contact: David G. Lister, Administrative Director, Common, Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

Oct. 9-15, Atlanta — **Intelcom 77**. Contact: Barbara Coffin, Promotion Manager, Horizon House International, 610 Washington St., Dedham, Mass. 02026.

Oct. 10-15, Chicago — **National Communications Forum — National Electronics Conference.** Contact: National Engineering Consortium, Inc., 1211 W. 22nd St., Oak Brook, Il. 60521.

Oct. 11-12, New Carrollton, Md. — **11th Annual Instrumentation & Computer Fair**. Contact: Liz Wahl, Program Coordinator, 11501 Huff Court, Kensington, Md. 20795.

Oct. 11-14, New Orleans — **13th Meeting of the Computer Performance Evaluation Users Group**, sponsored by National Bureau of Standards (NBS). Contact: Dennis M. Conti, NBS, A265/Technology Building, Washington, D.C. 20234.

Oct. 17-19, Seattle — **Association for Computing Machinery (ACM) 77 Conference**. Contact: Dr. James S. Ketchel, General Chairman, P.O. Box 16156, Seattle, Wash. 98116.

Oct. 17-19, Los Angeles — **New Tools and Techniques for Manufacturing Management,** sponsored by the American Institute of Industrial Engineers. Contact: Dept. PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Oct. 17-20, New York — **Information Management Exposition & Conference — Info 77**. Contact: Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

Oct. 18-19, King of Prussia, Pa. — **Second Annual Instrumentation & Computer Fair**. Contact: Liz Wahl, Program Coordinator, 11501 Huff Court, Kensington, Md. 20795.

Oct. 18-21, Newport Beach, Calif. — **Semiannual National Meeting of the Comten User Exchange**. Contact: Edwin F. Hart, Applied Physics Laboratory, Johns Hopkins University, Laurel, Md.

Oct. 19-21, New York — **How to Prepare Airtight Computer Contracts.** Contact: Radley Communications Ltd., 509 Madison Ave., New York, N.Y. 10022.

Oct. 19-21, San Francisco — **1977 Fall Conference of the Association of System 2000 Users for Technical Exchange**. Contact: Edward B. Denson, Illinois Central Gulf Railroad, 233 N. Michigan Ave., Chicago, Il. 60601.

Oct. 23-26, Detroit — **Business Forms 77**. Contact: National Business Forms Association Program Coordinator Julie C. Davis, 433 Monroe Ave., Alexandria, Va. 22301.

Oct. 25-26, New York — **Conference on Electronic Mail,** sponsored by Yankee Group. Contact: Carolyn Matthews, P.O. Box 43, Cambridge, Mass. 02138.

Oct. 25-27, Compeigne, France — **International Federation of Automatic Control (IFAC) Workshop on Information and Systems**, sponsored by Association Francaise Pour la Cybernetique et Technique. Contact: Prof. B, Duboisson, Universite de Technologie de Compeigne, B.P. 233, 60206 Compeigne Cedex, France.

Oct. 25-26, Washington, D.C. — **Advanced Structured Techniques**. Contact: Infosci Inc., Box 7117, Menlo Park, Calif. 94025.

Oct. 25-27, Anaheim, Calif. — **Electro-Optics/Laser '77 Conference & Exposition**. Contact: Technical Program Coordinator, Electro-Optics/Laser '77, 222 W. Adams, Chicago, Ill. 60606.

Oct. 26-28, Minneapolis, Minn. — **Educom Fall 1977 Conference: "Closing the Gap Between Technology and Application."** Contact: Educom, P.O. Box 364, Princeton, N.J. 08540.

Oct. 28-30, New York — **Personal Computing Expo**. Contact: Ralph Ianuzzi, Show Manager, H.A. Bruno & Associates, Inc., 78 E. 56th St., New York, N.Y. 10022.

Oct. 31-Nov. 3, Detroit — **Computer-Aided Design and Computer-Aided Manufacturing Conference and Exhibit.** Contact: Tom Akas, Society of Manufacturing Engineers, Box 930, 20501 Ford Road, Dearborn, Mich.

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Editorials

Do We Really Need It?

For years we have questioned the worth of the Federal Bureau of Investigation's computer-based National Crime Information Center (NCIC).

Now an independent panel of the Scientists' Institute for Public Information (Sipi) has also questioned the overall efficiency and effectiveness of the computerized system.

The earlier criticisms were mainly about the procedures used by the FBI to ensure that the records contained in the system were both up-to-date and accurate.

Those criticisms are still valid, according to the new report.

But even more disturbing is the fact that Sipi concluded the system may not even be effective for its stated purposes.

For a "vast system, containing over six and one-half million records with 250,000 transactions per day, the 'hit' ratio was not demonstrated to be impressive.

"The actual benefits of NCIC still remain in the area of surmise, rather than demonstrated results," the report said.

In the past, many proponents of the FBI's system have argued that those benefits do outweigh the occasional violations of privacy and human rights that occur.

But now, even those benefits are apparently in doubt.

If the NCIC is as inefficient as charged even the arguments of efficiency are no longer valid — and clearly the system cannot be justified on its privacy record.

The NCIC should be taken out of the hands of the FBI immediately and be constituted as a neutral independent agency such as that proposed by the original Project Search committee in the early '70s.

At the same time, the entire operation should be studied objectively and those parts which are found to be the most inefficient should be dropped out of the system.

As long as the NCIC is part of the FBI, that agency will continue to function more like a national police force than like the federal investigative agency it is supposed to be.

If the NCIC is divorced from the FBI, that agency will be freed to do the job it was established to do — and the overtones of "big brotherism" will be decreased.

And an independent study may find that we need no NCIC at all — finally.

Users Deserve to Know

IBM reportedly has several thousand orders for its 3033 processing unit — a CPU that clearly offers price/performance benefits for users.

At the same time, however, reliable reports both in the press and the user community indicate the firm will only build 800 to 1,000 of the units, which are not scheduled for initial delivery until next year.

Obviously, some users are going to be disappointed when they find they are not scheduled to get their 3033s for quite a while.

IBM should immediately let users know when they can expect delivery of the new unit, so that users can make appropriate plans — including the 3033 or some alternative mainframe.

By playing it cozy with delivery dates, IBM will only serve to alienate more users than it satisfies.

Data Past

Five Years Ago
Sept. 20, 1972

WASHINGTON, D.C.— A draft revision of the 1968 Cobol standard was completed by the American National Standard Institute (Ansi) technical committee X3J4. Users were urged to comment before Ansi's full X3 Computers and Information Processing Committee began its formal consideration of the proposal. Under the plan, there was to be a nucleus and 11 functional processing modules in the complete ANS Cobol, rather than eight.

— — —

DES MOINES, Iowa — Des Moines police kept secret computerized intelligence files on "persons of interest" for more than a year, and although some of the suspects were never convicted of any crime, the reports labeled the individuals as "known criminals." The descriptions could be made available, upon request, to law officials throughout Iowa, as well as police, FBI agents and other officials across the country.

Eight Years Ago
Sept. 24, 1969

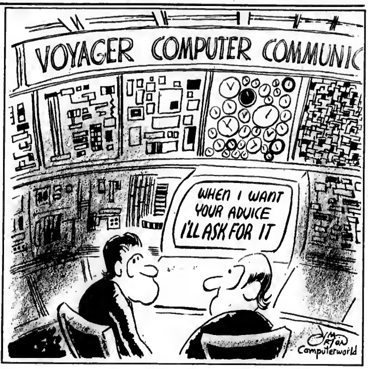
Control Data Corp. separated the pricing of its hardware, software and services. At the same time, CDC announced a price increase averaging about 5% on hardware and maintenance.

General Electric, just before the CDC announcement, said it would not further separate the pricing of hardware, software and services. GE also announced price increases ranging from 3% to 5.1%.

— — —

NEW YORK — A microfilm retrieval system that made use of a remote time-sharing computer was demonstrated here.

The system, developed by DSI Systems, Inc., made it unnecessary for the user to have an in-house computer available to retrieve documents from microfilm files. It was also much cheaper than maintaining data on tape or disk either in-house or at a service bureau, according to the company.


VOYAGER COMPUTER COMMUNIC
WHEN I WANT YOUR ADVICE I'LL ASK FOR IT
JIM ORTON
Computerworld

Letters to the Editor

Stronger, But Not Faster

I was somewhat amused by the implication in the article on the Voyager II computer problem [CW, Sept. 5] that the installation of the largest disk antenna ever used is resulting in a decrease in radio wave propagation time.

The size of the antenna, of course, will not affect propagation time. The increased distance involved requires that a stronger radio signal be transmitted in order that the signal strength, as received at the Earth, will be sufficient for reliable reception. The larger antenna effectively results in the transmission of a stronger signal.

Robert E. Hubbard
Lakeland, Fla.

Cartoonist Needs Debugging

Jim Orton's cartoon about copyrights, on the editorial page of the Aug. 22 issue, looks like sour grapes to me.

The cartoon seems to imply that copyright lawyers who know something about DP are only interested in the money they can collect for rendering services to data processors by obtaining copyrights for them. I wonder how Orton ever developed such a notion.

It is easy for a data processor to obtain copyrights without the aid of a copyright attorney. All he has to do is write to the Register of Copyrights in Washington, D.C., and ask for a set of instructions and then follow them.

But a copyright lawyer familiar with DP can sometimes make the process simpler and less expensive.

There is a lot more to copyright law and program protection than just learning how to register a copyright, just as there is a lot more to programming than just reading a programming manual. There is a role for copyright lawyers, as well as programmers and even cartoonists, in society.

Let us debug your cartoonist.

Reed C. Lawlor
Los Angeles, Calif.

IBM Sales in South Africa

An article in the Aug. 22 issue ["South African Users Tighten Belts"] implies that some IBM sales to Anglo-American Corp. in South Africa are inconsistent with a statement I made at our annual stockholders' meeting. That is not true.

What I said at our annual meeting was that IBM would not bid any business where we believe our products are going to be used to abridge human rights. We are satisfied, from the knowledge available to us, that the application mentioned in no way abridges human rights.

Frank T. Cary
Chairman of the Board
IBM
Armonk, N.Y.

Rigo 'Mandatory Reading'

Congratulations to Joe Rigo on his letter to Ken Lord in the Aug. 29 issue. Joe, I wish I had been the one to say what you said regarding the Certificate in Data Processing (CDP), the Certificate in Computer Programming (CCP), the Code of Ethics and professionalism in general in the data processing industry. This was one of the best reader commentaries I have read in the 12 years that I have been in the business. I have made it mandatory reading for my entire DP staff.

I agree with you that the Carmine Vonas of the world neither want nor need the CDP or CCP titles because they neither help nor hinder those people. Those who do need these titles will never be the Carmine Vonas of the world.

David A. Reser
Long Beach, Calif.

Meet Reveals DP Team Research 'Alive'

By Jack Stone
Special to CW

Would you believe it? Several hundred data processing people plus a handful of sociologists and psychologists working beautifully together!

You and I both know that it was not a large-scale systems development project. The occasion was the annual meeting of the Association for Computing Machinery (ACM) Special Interest Group on Computer Personnel Research (SIGPCR), which spent two days in August grappling with the toughest set of problems facing DP management today — getting DPers to work and communicate together with other DPers — and users — and executives.

And what a job they did! In my opinion, it was the best organized and most meaningful conference of its kind.

I thought it might be useful to offer some general observations I made about the gathering and then discuss just a few of its many, many highlights.

First, I was very impressed to learn that so many projects dealing with DP team development have left the behavioral science laboratories and are now under test in "live" situations.

Second, I was rather overwhelmed with the quality and diversity of the topics covered in the conference. (This is a fancy way of saying that I felt like a rank amateur in this crowd.) But how knowledgeable are you about these ideas that were discussed?

They included structuring the organization "climate," "synergistic" EDP teams, the computer "job environment model," the theory of DP organization behavior and group effectiveness, the "creeping commitment" phenomenon, team "constituency," the DP "inspection team," "organic-adaptive" DP management, and "pluriprogramming"!

Third, there was a strong undercurrent of humility among the speakers and the audience. Most of the attendees seemed to feel, as did I, that the conference was breaking new ground in this most crucial field and a gigantic job lies ahead, but the effort is underway.

Now for a sprinkling of some of the high points.

Alonzo Grace of A.G. Grace and Co. has studied the application of the concepts and practices of structured programming to management problems in general, and DP systems management problems in particular. He observed that the recent stories of structured programming successes that have appeared in the literature have all involved productivity gains of *small* groups of people.

He has addressed the question of improving the productivity of the large DP organizations, seeking not the order of magnitude improvements that have been reported but rather a more modest 10% improvement per year sustained over several years. His approach is to view the productivity project as a systems problem to be attacked in an organized way.

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

However, he was quick to note that, for the large organization, a productivity project may be far more complex than any DP systems project because many DPers are not inclined to take DP organization strategies seriously enough.

Nancy Anderson and Ben Shneiderman of the University of Maryland talked about the use of peers, rather than managers, for the evaluation of the "quality" of programs. Their idea is to conduct an annual or semiannual review, administered by a practicing programmer. The review is not for the purposes of determining promotability or salary, but for programmer education, improving cooperation and communication in the team, and self-evaluation. They are supportive of this approach in part based upon the practices of other professions, such as medical, psychological and academic, who typically use peer review boards to evaluate the quality of their work.

The Human Connection

Philip Semprevivo, with the computer center of the State University of New York at Albany, presented some novel (to me, anyway) observations about team approaches to systems development. He noted, for example, that there is not, in practice, the team approach. Instead, there appears to be a wide variety of possible approaches.

The existence of this diversity derives from two factors. The first relates to the actual breakout of group vs. individual work, since the fact that a "team" has been organized does not necessarily mean the people will actually engage in group work activities.

The second relates to the notion of team "constituency" which helps to define the actual composition of the team, taking into account the formal versus informal modes of operation. He made explicit reference to a well-known adage (which we all ignore in practice) when he stated, "Groups whose organizations appear to be the same may possess very different informal organizations which affect dramatically the ways in which they operate."

David Skeen, with the Office of Naval Research, provided a thoughtful analysis of the involvement of users with DP systems development. In his introduction, he neatly identified the three major problems underlying the unending failures of software development projects when he said: "DP did not understand the area of application, the user did not or was not allowed to fully participate in developing the project, and commmunications between DP, the user, and top-level management deteriorated almost to the point of physical violence."

Finally, a personal note. My reason for attending the conference was to listen quietly (sometimes difficult for me) to the real experts in the field. Imagine my surprise and pleasure when Joan Franz, from the University of California, in her paper on DP group effectiveness, quoted liberally from a recent *Computerworld* article [Aug. 9, 1976] titled "DP Managers Must Stop Fire Fighting and Start Managing" written by that renowned authority, Jack Stone!

For information on SIGCPR, contact ACM, 1133 Avenue of the Americas, New York, N.Y. 10036.

Loophole Crops Up on IBM/Australia Front

The Taylor Report

By
Alan
Taylor
CDP

IBM World Trade's Ralph Pfeiffer narrowed the issues [CW, Sept. 5] but his letter showed up a loophole left by the Australian Parliament when it tried to forbid deceptive and misleading practices effective this July 1.

Apparently there is common ground in regarding any of the practices as wrong. Pfeiffer said the "Unfair Practices" section of the act is in keeping with the IBM guidelines on employees worldwide." But presumably, he would agree that what is wrong for individual employees is also wrong for the corporation itself. If so, we don't have to deal further with the question of right or wrong — merely with appropriate punishment. That simplifies matters.

However, his comment that IBM operations won't be strangled in Australia and that "It should be noted that contracts in force before July 1, 1977 are not affected by the amended act," does show up a loophole that arises from IBM's contracting techniques. It seems unlikely that the Australian Parliament was permittting any deceptive practices to continue after July 1 when it excluded contracts made before July 1. It seemed to have been seeing to it that people would not be punished for actions that were lawful when performed. Thus, any new computer or software that was ordered before July 1 presumably would not come under the Trade Practices Act.

What Pfieffer's letter draws attention to is that new computers can be announced and sold — even by deceptive and misleading practices which take place since the act went into effect — and yet may be exluded from its provisions! This is because IBM can claim that even newly announced machines are being sold under contracts that were signed before July 1 and which exclude or limit liability.

Under IBM's contracting practices, this is the normal state of affairs and apparently Pfeiffer believes that World Trade can indefinitely continue selling — outside the terms of the act — to the 312 or so current IBM installations.

Pfeiffer claimed he objects to open-ended liability for damages caused by World Trade. Apparently he wants some ceiling but does not suggest a specific one. Last April, IBM announced a new form of contracts which gave a ceiling of $100,000 or 12 monthly payments (about a quarter of the selling price) of the specific machine in question. Assuming Pfeiffer would propose a ceiling on a similar basis, let us see whether it would prevent a corporation that markets computers from profiting from deceptive practices in Australia.

The method of obtaining damages in Australia, as in most parts of the free world, is to take the matter to court. This can be expensive, and such expenses are often not under the control of the complaining party. The accused firm also has many rights under the court process and can, by perfectly proper legal

(Continued on Page 16)

What I Said Was . . .

Readers of Ralph A. Pfeiffer Jr.'s letter of Sept. 5 should know that the items he claimed I had stated are inaccurate interpretations of what I really wrote.

Pfeiffer said, "It is not true, as Taylor stated, that IBM is objecting to the 'Unfair Practices' section of the act." On Aug. 8 I wrote, "What is becoming clearer, however, is that what IBM is objecting to is Australia's action to make all firms, large and small, responsible for damages caused by 'deceptive' and 'misleading' conduct." It is that responsibility to which IBM still objects.

Second, Pfeiffer wrote, "Taylor also stated that IBM Australia's action could 'strangle' IBM customer operations there." In my column of Aug. 1, to show the power of IBM under its current contracts even with regard to non-IBM-owned IBM computers, I had written "Potentially, therefore, it would be possible for an IBM withdrawal to effectively strangle the use of any or all of the 312 installed IBM systems."

Letters to the Editor

Eyeing 'Big Brother Land'

All arguments and rationalizations that diminish the exclusivity of a mailing list are merely lubricants that grease the rails to "Big Brother Land."

The supposedly simple protective questions cited by Alan Taylor [CW, Aug. 15] are reduced to absurdities by their very nature. Consider the futility of attempting to define in advance those things that might "harm" or "embarrass" an individual at some future date or of predicting all the "... possible future uses of the information ..."

Consider further the uselessness of the individual's being able to "withdraw approval" after some form of damage has already been done.

Obviously, if each compilation of personal data is treated as an absolutely exclusive domain, vast redundancy and inefficiency will exist. However, better that than the slow erosion of privacy which (future technology permitting) must ensue if various sources of information are exchanged and integrated until, quite logically, the entire society is included in one monolithic data base.

Sheldon J. Baer
Los Angeles, Calif.

Unjustified Assumption

Regarding the "Taylor Report" of Aug. 15, about selling DP lists, I think he has adopted the popular idea of today that all nonprofit organizations are good and all profit-oriented organizations are the bad guys.

I think this idea is too often unjustified. If, for example, the average corporate profit is about 5%, and I believe it is this or less for the latest year compiled, then similar nonprofit organizations should offer services that are at least 5% less cost per unit.

The nonprofit groups incur no property taxes, no sales taxes and no income taxes. In addition, they are entitled to reduced postage rates.

They often receive free labor from volunteers as well as discounts on purchases.

Do their services cost 5% or more less?

Robert Lumbrix
Marshfield, Wis.

STC Not Only Producer

The article entitled "STC 'Super Disk' Sales Enjoy Rapid Growth" [CW, Aug. 1] contained a glaring mistake.

In that article, it was stated "Today, the company has more than 15,000 tape drive installations and, except for IBM, is the only manufacturer in the world producing drives with a recording density of 6,250 bit/in." This is not exactly correct. Telex Corp. has also been producing 6,250 bit/in. tape drives as have both Siemens in Germany and Fujitsu in Japan.

In the OEM marketplace, Pertec Computer Corp. and Telex are also producing 6,250 bit/in. tape drives.

M.A. Lutvak
Memorex Corp.

4-Bit Word Too Short

In reading "Micro Programmers Seen Facing Old Problems" [CW, Aug. 15], I was struck by I. Barron's audacious suggestion of a 4- or 5-bit word.

4 bits allow 16 combinations; 5 allow 32. "English and a few numbers" indeed! Presumably, these would be numbers 1 through 6, and no spaces or punctuation.

Much data processing requires upper/lower case as well as the absolutely basic alphabet, numbers and a dozen or so punctuation marks. The minimal word length to allow this rather standard character set is 7 bits.

Multilingual bibliographic (or any textual) processing really demands diacriticals, bringing the character set up to about 240-250 characters.

I would be delighted to see Barron's proposed 5-bit character set (it might handle Hawaiian). His 4-bit set should be even more instructive for English.

Walter C. Crawford
Walnut Creek, Calif.

For Conservation's Sake

In view of the current emphasis in many areas on conservation, especially in regard to DP and its use of paper, I would like to suggest what I regard as a potential for tremendous savings.

The idea is simple yet far reaching. Have the writers of language translators eliminate the needless page ejects between the EXEC card, source code, end of source code, various tables and maps, diagnostic messages, link edit, cataloging status report and the end of job indicator.

In a typical compile, you probably have half a dozen pages with four or five lines printed on each one. Not only are these page ejects unnecessary, in some cases they are unwanted. I would prefer to have the phase name on the same page that the source code begins in order to eliminate confusion and possible loss of this valuable information.

I make infrequent reference to literal pool, register assignment, field definitions and displacements, so I could care less if they do not each begin at the top of a page. What is essential is that I be able to find them when I need them, and I could still do this with ease.

Two specific examples from my installation are:

- An 64K, 53-page Ansi Cobol compile could be reduced to 46 pages.
- A 14K, 12-page RPG II compile could be reduced to 7 pages.

The beauty of this suggestion is that there is no trade-off required to achieve these savings.

Jack O'Connor
Conway, S.C.

Loophole Appears in Law

(Continued from Page 15)

stratagems, push the cost of the suit above the $100,000 mark.

In the case of Australia, as with most World Trade countries, the cost would almost inevitably be above such a figure.

In fact, it would most likely be necessary to send lawyers from Australia to Tarrytown, where Pfeiffer's headquarters are, for instance, to find out what the corporation knew about potentially concealed defects. Even after visiting Tarrytown, the lawyers might well have to cover much more ground to track down IBM's knowledge. As a result, the damages ceiling would soon be reached in costs even before the trial started.

Further Victimization

So, a $100,000 ceiling would simply invite the further victimization of a complaining customer — which is what the Parliament clearly wanted to avoid happening in that country when it outlawed the enforcement of such limitations.

In fact, it seems likely that the victim's costs could reach a $10 million ceiling. Pfeiffer has given no indication that he would accept a $10 million ceiling, even though it would not be "open-ended liability."

Nor is the matter restricted to Australia. IBM tells me that when open-ended liability was being considered elsewhere, the firm took similar action. Where and how often I don't know, but it appears to be the general World Trade policy not to trade where it can be held fully responsible for damages it causes.

Hopefully World Trade will divulge its rationale for wanting to deny victims of admittedly wrong behavior their right to fully recover any losses. Such an explanation would fill a large void in the public understanding of the IBM vs. Australian Trade Practices issue.

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Hewlett-Packard

Computer Advances

Vol. 2 No. 3 September 1977

HP 2648 - a bright idea in graphics terminals

The controllers

The HP 2026 keeps the data flowing

A bright idea for a graphics display

The world of graphics is expanding to serve more and more people. High-performance graphics, previously found only with more expensive systems, are now available on the new HP 2648 which has microprocessor control and uses raster scan technology.

The advantages of refreshed raster scan technology are a continually bright display and selective erase—the ability to make changes without having to redraw the entire image. Raster scan graphics require a bit of memory for each displayable point. Low-cost, high-density semiconductor memory now makes this technology economical.

Ready to plot

The HP 2648 is usable the minute you turn it on. The terminal was designed to be system and software independent, to solve real world problems right away without additional investment in software. All the graphics capabilities are hardware and firmware implemented and executable as simple keystroke functions. Off-line, the HP 2648 can record locally-generated drawing commands on optional tape cartridges, play them back, and support graphics program development. With a CPU complement, the user can interactively create more sophisticated graphics.

◀ *Cover*
The design on the screen of the HP 2648 was zoomed to a 10 times magnification. The pattern used emerged from that enlargement.

Auto plot

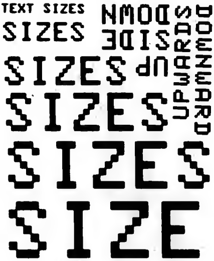
User-generated tabular data can be automatically plotted with X & Y axes. The data can originate from a computer program, from the mini-cartridge, or from the CRT screen. A simple set of questions, in the form of a "menu," is displayed for the user. After first answering these questions—thus defining the data parameters—the user starts the plotting with a single keystroke. Within seconds, and independent of any system or software, the data is plotted. Sophisticated graphic representation of data is now available to more people in business, education, science, and management.

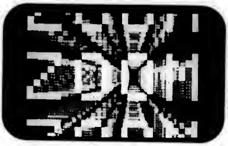
Try it first

There are times when you want to change your drawing without disturbing the data points stored in the CPU's memory. The rubber band line offers a snappy solution to such trial sketches. Line drawings, such as architectural floor plans, can be made and modified quickly. They can even be recorded off-line on the optional mini-cartridge tapes for later batch transmission.

Choices galore

As a user of an HP 2648, you can choose characters of varying shape, size, and orientation, and can right/left justify.



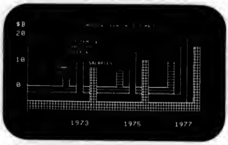


Zoom and pan

Select an area of your display; move right in and magnify it. Zoom one step at a time, or with the touch of a key, zoom automatically to sixteen times the size. Then, pan in any direction through this enlarged display for closer investigation of complex designs. You do not need to reinitialize the data, since the graphics memory has not been disturbed. As zoom and pan are under microprocessor control, they are system and software independent. Without any special software packages or user programming, you can zoom and pan on or off-line.

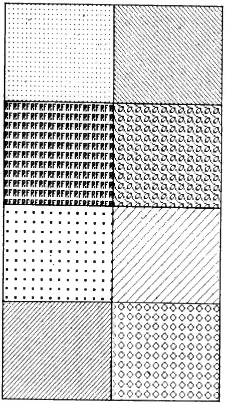
Now you see it, now you don't

The independent alphanumeric and graphics displays each have their own separate random access memory (RAM). So you can view the displays independently or both at the same time. Either memory can be suppressed without disturbing the other. Interact with the CPU/program in one memory and view the resultant picture in the other. This feature makes the HP 2648 perfect both for program development and trial-and-error graphics generation.



Shade your drawings

Rectangular area shading helps distinguish similar shapes. The user can specify different portions of the drawing to be shaded with any of eight available patterns or with his or her own design.



Two terminals in one

The HP 2648 is a dual-capability terminal. Not only can it do sophisticated graphics; it also has those characteristics of HP's 2645 data entry and communications terminal that make programming so easy. These include flexible communications protocols, eight user-programmable keys, full editing, block or character transmission, and off-line data preparation with the dual mini-cartridges. This graphics and alphanumeric combination results in an especially versatile tool.

In the U.S., the HP 2648 costs $5500; when equipped with cartridge tape drives, the price is $7100. Quantity discounts are available.

It is difficult to describe on paper what happens on the display of an HP 2648. **Check A on the reply card for a live demonstration or for more information.**

There's more than one way to weigh a mouse

There's more than one way to weigh a mouse because there's more than one Hewlett-Packard controller that can automate and control processes such as the weighing of medical research animals. Mettler Instrument Corporation of Princeton, N.J., for example, selected HP 9815 desk-top controllers for electronic balance systems that quickly weigh animals that don't want to be weighed. Hazeltine Corporation, of Green Lawn, N.J., on the other hand, plans to weigh fidgety animals using HP 2649 terminal/controllers. One of these products may be the way to solve your controller needs

Terminal controllers

Hewlett-Packard's 2649 is a versatile, microprocessor-based terminal/controller for which technically-oriented users can design their own firmware or hardware. With the help of a Technical Information Package, custom designing application firmware is a three-step process.

Application programs are first assembled on any system capable of producing 8080 object code, such as an HP 1000. Object code is transferred from the program development system to mini-cartridges using an HP 13290 development terminal.

The second step is to test and debug the application firmware by loading and executing these mini-cartridges into the RAM of the development terminal.

Then, application firmware object code is transferred to programmable-read-only-memory (PROM) chips for installation in multiple HP 2649 terminal/controllers. For high-volume applications, read-only-memory (ROM) chips are available from specified vendors.

There are two ways a designer can interface the HP 2649 to external devices. With HP's standard interface cards that provide for serial or parallel data transfer, the user need only fabricate a cable to complete the interface. If the application requires a nonstandard interface, users can design and build interface cards that plug into the back plane. The HP 2649 has eleven optional hardware slots available for I/O, display enhancements, or memory.

Inherent networking capability of the HP 2649 makes it an ideal tool for interfacing specialized devices to various mainframes. Devices controlled by the HP 2649 vary widely. Among them are laboratory scales, cash registers, typesetting equipment, and analog sensors.

Because of the software and hardware development needed to customize an HP 2649, it is most economical when a quantity of systems are needed for dedicated applications. In a business or industrial environment, where untrained people are using the terminal, the customized HP 2649, with its display screen and modifiable keyboard, becomes an especially friendly interface. The HP 2649 costs $2150.*

Buy a board, build a system

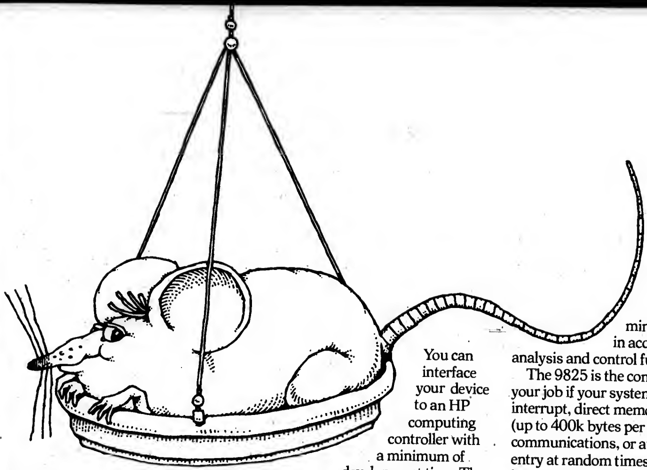
For the OEM designer who needs the power and flexibility of a microprogrammable minicomputer, HP offers the K-series processor, a component version of the 21MX computer family.

Designed to fill the need for high-power processing in a low-cost form that integrates easily into OEM systems, K-Series components offer flexibility in configuring inexpensive products with the full power of a minicomputer. The K-Series can be a full minicomputer that is hardware and software compatible with HP's entire 21MX line. Or, systems engineers can gain direct access to an extraordinarily fast control processor with 325 nano-second cycle time and 210 powerful microinstructions.

HP 2649

HP 21MX-K

Hewlett-Packard



Among the many systems applications which can use the speed and power of K-Series components are spectrophotometers, numerical control units, smart data-entry terminals, word processing equipment, graphic display systems, medical diagnostic systems, and many kinds of test equipment. Because the K-Series uses the same I/O scheme as the 21MX family, a wide selection of subsystems is available. These include interface cards for data communications, measurement and control, HP-IB**, and all of HP's broad range of computer peripherals. Prices for the processor board (OEM quantity 100) are $975.*

Just plug them in and program

HP computing controllers, the 9815 and 9825, make system automation easy and direct. Unlike microprocessors and minicomputers, these controllers are integrated in a small, self-contained package that includes printer, tape storage, display, and keyboard. And, you get an operating system and high-level language (pre-programmed in ROM) so you do not need to learn machine language.

You can interface your device to an HP computing controller with a minimum of development time. The physical connection is an off-the-shelf interfacing card with a pre-programmed I/O driver in its read-only memory. You choose from four different interface options — BCD, bit parallel, bit serial (RS-232-C), or HP-IB**. Just insert the card into the controller, and connect the cable to your product. The controller is ready to be programmed for your application using a powerful but simple-to-learn, high-level programming language. HP 9825's HPL provides the ease of BASIC with much of the power of FORTRAN. The HP 9815 uses reverse polish notation, RPN.

Computing controllers manage your instruments, gather data, and process the data to present it in an understandable form. For selected medical and analytical instrumentation applications, and for many measuring systems, HP's computing controllers deliver performance paralleling that of many minicomputers in acquisition analysis and control functions.

The 9825 is the controller for your job if your system requires interrupt, direct memory access (up to 400k bytes per second), data communications, or automatic data entry at random times; or if you will be working with data bases of more than 100,000 bytes. If these capabilities are not essential, consider the HP 9815. It is the perfect cost effective controller for systems of one or two input or output devices.

The HP 9825 is the first small desk-top computer with interrupt capability. Interrupt gives the controller flexibility to respond to several independent devices that require service at unpredictable times. "Live keyboard" capability enables you to interrupt the 9825's processing to calculate or to interrogate — for example, to monitor a program, or to alter a variable while a program is running.

The HP 9815 is available for $3100*; the HP 9825 for $5900.* **For more information on HP's controllers, the 2649, 21MX-K, 9815, and 9825 indicate B, C, D, and E respectively on the reply card.**

*U.S. domestic prices only.
**HP-IB is Hewlett-Packard's implementation of IEEE Standard 488-1975, "Digital Interface for Programmable Instrumentation."

The HP 2026–and how it keeps the data flowing at Hewlett-Packard

Hewlett-Packard's 2026 data entry and communications system takes a dramatic step beyond traditional data entry. Besides source data entry, it also supports local data storage and retrieval, data communications, and remote job entry—all in a single proven package that costs $38,500.*

The terminal-intensive HP 2026 system is suited to large companies with geographically-dispersed locations. It satisfies their need to enter, store, and retrieve data locally, yet process it elsewhere.

Source data entry

The powerful Data Entry Application Language (DEAL) makes the development of data entry applications quick and easy. With development of screen formats at a central location, DEAL ensures that the same set of screen formats and edit specifications are used throughout the HP 2026-based network. Source data entry, then, is complete, accurate, and consistent.

Local storage and retrieval

File management capability gives users the ability to quickly scan and retrieve information locally. It eliminates the need to enter repetitive data, and allows sophisticated source data editing.

Point-to-point communications

Any HP 2026 system can act as a central data collection point within the network or transmit information directly to any other HP 2026. Use of innovative software technology results in significant reduction of data communications costs.

Remote job entry

An RJE capability allows any HP 2026 system to communicate directly with large computers, such as HP 3000's or IBM 370's.

The basic HP 2026 system consists of an HP 21MX E-Series processor and disc drive in a desk-style cabinet, and an HP 2645A console terminal. Each HP 2026 can support a total of sixteen additional page-mode multidrop, 9600 baud 2645A CRT terminals. If your applications require more than just data entry and retrieval, and you need sophisticated data management, data processing, or program development using traditional programming languages, Hewlett-Packard offers the multi-purpose HP 3000 computer system.

The HP 2026 was originally developed to meet Hewlett-Packard's needs. Today, after six years of intensive use, it affects virtually everyone at HP...

"Over 10 million words funnel through my data center every single day"

Bill Taylor, HP 2026 manager at HP headquarters, comments; "It's a flexible, all-purpose network that transmits any digital information. Our central system receives data several times a day from other 2026 locations around the world.

"Sixty percent of the data is marketing-related," Bill states, "such as customer orders and acknowledgements. Fifteen percent is accounting data, 10% is employee personnel/payroll data, another 10% is general message traffic, and 5% special files.

"An RJE capability also allows HP 2026 sites to directly communicate with larger host computers. Communication is possible via

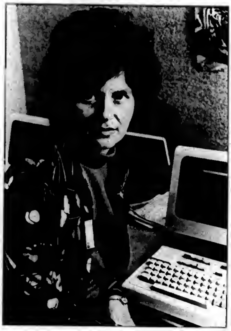
*U.S. domestic price (currently available in North America and Europe only)

2780 emulation and multileaving HASP workstation protocols. All data communications and RJE programs can be executed concurrently with data entry."

"With just 20¢ and four hours I can send a message to any HP office in the world"

"It wasn't that way six years ago; our commercial TWX service costs were skyrocketing," reflects Bob Boniface, Hewlett-Packard's executive vice president of administration. "Now, with the 2026 network, 117 systems at any of 94 network sites can communicate with each other. And . . . the costs are descending, not spiraling upward."

"If I ever again had to enter orders the way we used to, I'd quit"



"I transmit over 3700 sales and service orders monthly," begins Carol Larsen, HP order entry clerk. "As I input an order, the HP 2026's CRT terminal prompts me through all the screens I need. And, it blinks to alert me if I make a mistake. Most errors are corrected at the terminal, so only valid data is transmitted to the system.

"We received the system 1:30 one afternoon," Carol relates, "and, by the time I went home, I felt comfortable using it. I didn't even pick up a user's manual — the terminal taught me with a 'how to' tape cartridge.

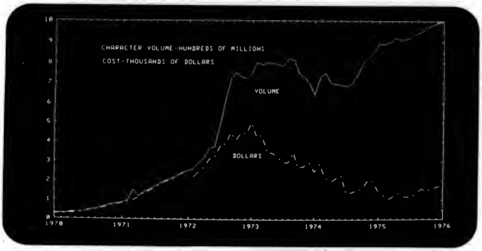
"Besides entering new orders, I can store and retrieve order status here, where we need it, to assure quick response to customer inquiries. If a customer calls me about an order, I simply key in that order name and number, and provide a timely status report over the phone.

"Plus, I don't have to type repetitive data. Our sales office assigns a number to each customer. By entering that number alone, I can retrieve and automatically include customer name, address, phone number, shipping destination, and other pertinent information — all stored on local files."

"We paid off all our capital equipment costs in nine months"

"The HP 2026 gave us a significant, easily-measured return-on-investment," says Hank Taylor, HP corporate marketing services manager.

The HP 2026 (cont.)



In the last four years, the domestic volume of data transmitted by the HP 2026 has more than doubled. But, during that same time, costs have decreased by 60%.

This graph was generated by "auto plot" on the new HP 2648 graphics terminal. (See page 3)

"Comparing data communications costs before and after installing the system revealed that, in less than a year, our line charge savings paid for the system.

"I also recall another significant measure. HP's data entry error rate decreased by 60% using HP 2026 system CRT's rather than former methods. This reduction in errors is also a result of the use of the HP 2026 Data Entry Application Language (DEAL). This powerful software simplifies and shortens the source data entry program development process.

"You see, our central data processing staff develops all data entry screens so that consistent formats and edits can be transmitted to each HP 2026 site. In this way, we maintain central control and ensure that everyone in the network is using the same set of data entry screens. All the development is done by one central data processing staff. Remote sites, of course, still have the capability through DEAL to quickly tailor our screen formats without data processing experts."

"HP'S 2026 is one of the most efficient point-to-point communication systems available"

"We use voice grade common carrier facilities and two HP 2026 data transmission innovations which make the system unusually efficient," explains Terry Eastham, lab engineer.

"A data compression/expansion technique used between HP 2026's typically compresses our data to 50% of its original volume," continues Terry. "Blanks, numeric strings, alpha strings, and redundant data are compressed and expanded by this feature. In addition, we use a reverse channel line protocol which can yield up to another 40% throughput improvement over normal bisynchronous techniques.

"The combination results in reduced data transmission time and, therefore, significant line cost savings."

For further information on the HP 2026 and HP 3000, check F on your reply card.

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Letters to the Editor

A Hearty Endorsement

I heartily endorse the sentiment expressed in the editorial of Aug. 29 entitled "First Things First." The continued development of the information sector is dependent upon public confidence that basic rights, such as the right to privacy, will be protected.

Problems arise when these rights collide with competing values such as freedom of information, criminal justice requirements, welfare reform, economic activity and oversight of government. Experience has shown that privacy protection must accommodate such values whenever possible; otherwise, it is privacy protection which is too often forced to give way.

National information policy should reflect the need for such accommodation by providing a focal point for choosing between competing values. In this way, it would neither threaten nor ignore individual rights but would instead be a major element in their preservation. *Computerworld* has reminded those who will be shaping that policy of its importance.

Quincy Rodgers
Washington, D.C.

Rodgers is former director of the White House Committee on the Right of Privacy and project director of the "Report to the President on National Information Policy." Ed.

Advice for Mini Users

In the Aug. 29 issue, the report on a survey of over 200 mini users generally showed the minis were rated very highly, but there were some adverse comments on software.

As a user, I have found that if the jobs are small but complex, it is best to train the users to write their own limited software programs. If the jobs are complex with large amounts of number crunching, the best method is to use professional programmers. In either case, it is vital that users understand both software and hardware if they are to get good results.

With minis, the user comes closer to hardware and software, and with micros, hardware and software will often be on users' desks.

Under these circumstances, users of the future will prepare more of their own programs, Professional programmers will have to be more intelligent, sensitive, imaginative and even intuitive to meet the users on common ground. Programmers will have to understand users and the users might even have to understand the programmers.

James G. Ryan
Lexington, Mass.

Three Points to Make

The Aug. 29 issue contained three items of particular interest to me. The first is very important.

Robert Bigelow's letter in reference to Frederick Withington's testimony brings up a critical point. While a court might force a physician to reveal facts, I do not think it could force him to practice medicine, i.e., diagnose or treat a patient. In the same way, I feel the Arthur D. Little position is correct.

Second, Jack Stone's article on automated physicians is about as appropriate as some early thoughts about piloting planes. While coordinating the computer programming of all vendors on the Sage air defense system in the late 50's, I knew there were those who thought we could eliminate pilots. We still use pilots, accountants and part clerks. My organization uses computers to facilitate the work of physicians, but I'm sure the MDs will be around as long as the pilots, bookkeepers and the two men in the petroleum cracking plants.

And finally, Joe Rigo is very sharp after 13 years of experience in the field. When I had 13 years' experience, Roger Hallock of TAC taught me about whole new areas of pre-entry data organization. A few years back (17 years' experience) I discovered I knew nothing about data bases. Anything, even the Certificate in Data Processing, that broadens a practitioner's comprehension of the field is valuable.

Hugh Cort
Medical Center
University of Alabama
Birmingham, Ala.

Disturbed by 'Controls'

The article "Controls Urged on Technology" [CW, Aug. 15] disturbed me considerably. How a man (Josef Kates) from a free country can suggest "national controls on technological innovation" reaches far beyond my logical reasoning process. Surely he meant "guidelines" or "prevention of misuse" but not all-out government controls.

In the editorial "A Comforting Thought," in the same issue, an unnamed "Western Cybernetics expert" states "Americans have dealings linked with a computer at least 10 times a day." If that were even close to the truth, Mr. Kates' wishes, if ever realized, could have a profound effect on our lives.

"Technological sovereignty as a prescription for Canada's difficulties" is like a doctor prescribing cyanide to combat a cold. It eliminates the cold but kills the patient.

Wes Williams
Downey, Calif.

Removing the rose-colored glasses.

A realistic look at *Data Base Management Systems* in the October 31st *Computerworld.*

In the ten years since Data Base Management Systems were introduced they've grown to a multimillion dollar subindustry in their own right. As late as 1973, less than 1,000 DBMS were installed; but International Data Corp. estimates that over 5,000 are in use today, and this number will increase to 8,200 in the next two years. This phenomenal growth has been fueled by the hoped-for benefits of DBMS, which include increased programmer efficiency, the elimination of redundant information in the data file, and greater ease in coping with system upgrades and reprogramming.

But a data base management system should be evaluated carefully before you commit to purchase. They have developed such a reputation as problem solvers that people tend to expect more from them than they can achieve, while overlooking or minimizing the effort required.

We'll have several experts on hand to help you arrive at a realistic understanding of DBMS in our October 31st special report edited by Don Leavitt. Here is a sampling of the kinds of articles you'll see:

- Combatting the "Holy Grail" syndrome — Being realistic about the benefits that are possible in relation to the effort required; how to assess whether DBMS will enable you to reach your goals.
- How well are installed systems living up to expectations? A review of typical problems that need to be overcome.
- The role of the Data Base Administrator in DBMS — including considerations like the physical arrangement of the data base.
- How dictionary packages, report writers, etc. interface with DBMS software.
- A review of selection criteria and the implementation process.
- How DBMS ties in with distributed data processing — matching intelligent front ends with intelligent back ends, for example.

As this short preview shows, our special report on Data Base Management Systems in the October 31st issue will interest people who are considering DBMS, as well as people who already have one installed. And if you market Data Base Management software, remember that your ad will reach more of your primary audience here. Ad closing date is October 14. Your *Computerworld* salesman has all the details. Or call Terry Williams at (617) 965-5800 to reserve space for your ad.

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Letters to the Editor

Poorly Developed Theory

The Aug. 22 column by Jack Stone, "Where Are the Operations Success Stories," contained a thesis I found poorly developed and unsubstantiated. Stone may have a wide circle of contacts but his implied conclusion that there are few successful operations is presumptuous and naive.

We all come to conclusions about our own experience and environment from time to time, but we cannot validly extend our conclusions universally without some kind of analysis, survey or substantiation.

I know of successful operations and of some rather less than successful. Condemning them all in a column of a widely read publication is old hat, passe, unrealistic and no longer interesting. I thought our profession was growing out of that tired approach.

Perhaps Stone was "baiting" readers. A simple request published in the column would have been more appropriate and perhaps more fruitful.

Jean A. Fowler
Raritan, N.J.

Umpires in the DP Game

In the Aug. 22nd issue, Jack Stone, in his search for a successful data processing manager (DPM), brought to light a tragedy caused by organizational hierarchy.

This company hierarchy includes everyone from the president to the lowest clerk. DPMs are somewhere in the middle, with roles similar to those of umpires in a baseball game. They must call the pitches (reports) but they have no control over the game (management).

Under these circumstances, DPMs must consider themselves successful when they do their job well, and then accept the boos as all good umpires do. It's a tough job!

Happy DPMs are those who are lucky enough to be either aware of or involved in the total operation of an enterprise. It was no coincidence that his one successful case was actually involved in a scientific problem.

James G. Ryan
Lexington, Mass.

Root of Antitrust Delays

I have just recently read the article in the May 9 issue entitled, "U.S. vs. IBM Shows Shambles of Antitrust Law, Senate Told." That article characterized my May 4 testimony before the Senate Subcommittee on Antitrust and Monopoly to the effect that "He, too, put the responsibility for defining the direction of these suits at the doors of the judges who hear them."

The title of your article, the above quote and your use of my statement to the subcommittee that I have "no defense" for the longevity of the IBM case make it appear that I singled out one government case for criticism, above other major government antitrust cases.

The article does not reflect my remarks in context, nor my views. I certainly did not criticize the competence or performance of any judge; my point was aimed at a larger, generic issue.

The thrust of my testimony concerned the government's failure to properly investigate and then to manageably define the issues prior to bringing massive antitrust cases. This lack of issue definition by the government, in cases of major economic (and social) consequence, places severe burdens on the judicial system when it attempts, under the liberal federal discovery rules, to manage pretrial discovery. This, in my view, is a principal cause of complexity and delay in "big" antitrust cases.

The problems of administering complex antitrust cases are generic and require across-the-board evaluation and solutions. Simplistic solutions suggested by others — such as an "elitist" group of roving antitrust judges — read better than they will play, and they miss the mark.

The essential problem is to find the means to quickly define the issues in these major cases and, without depriving the parties of due process, make discovery and trial manageable.

Ira M. Millstein
New York, N.Y.

CRTs Can Be 'Congested'

I was interested in the article "Caution: CRTs May Be Eye Hazard" [CW, July 18]. I must disagree with Jeryl Sparks, who stated that the dot matrix print is "horrible." I have never seen any research that indicates a dot pattern is more difficult to read than individual lines forming the same character.

It seems to me the main reason for CRT terminal eyestrain is too much information on the screen. Operators must move their eyes continuously, putting strain on the eye muscles. Publications such as *Computerworld* recognize this problem and make their columns narrow. As a result, the eye can scan an entire line without having to move in a horizontal direction with resultant muscle strain.

I believe the problem is not having to focus on dots (although close work will cause eye strain), but simply that the eye has to move to read an 80-column wide line.

Byron Cole
President
Informer, Inc.
Los Angeles, Calif.

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I/O System Included

'TMS' Builds, Updates, Accesses Tables

By Don Leavitt
CW Staff

MILL VALLEY, Calif. — The Table Management System (TMS) from Jeffrey L. Walker & Co. was designed as a standardized, efficient means of storing and retrieving table information in an IBM 360/370 environment, according to a spokesman.

A table, in this context, is a group of arguments and results. An argument — essentially a record key — is known at table access time while the result — desired record data — is returned to the user by a successful table lookup operation, the spokesman explained.

TMS supports the creation and maintenance of tables used in systems and programs without requiring program changes, recompiles or relinks, he said. Using the software, tables can be created for one others.

Internally, the tables are retained on a random file and do not require reorganization even after changes of contents. A standard backup and restore capability is provided as part of the TMS package, the spokesman noted.

Each table can contain any number of entries; access to the table file from a user's application program is handled through the use of the package's search subroutine. It interfaces with the Input/Output System (Iosys) a file organization method used by TMS to perform all table I/O processing [CW, April 11].

Two user-oriented programs are part of the package. Tabsys is a batch program for table file maintenance; Tabl does equivalent work, on-line.

A series of available, separate-cost features can extend the basic package to include data compression and data protection support and interfaces to either the IBM CICS or the GBA International Swift teleprocessing monitors.

The basic package, described as device- and operating system-independent, requires 48K for the file maintenance subsystem.

The package costs $5,000 or $500/mo for a year; the options are typically an additional $1,000 each, the company noted from 655 Redwood Highway, Mill Valley, Calif. 94941.

For DG's RDOS Users

'Wordmap' Prints Cross-References

PALO ALTO, Calif. — A debugging and documentation tool, Wordmap from Information Processing Techniques Corp. (IPTC) was described by the vendor as a general-purpose, symbolic cross-reference generator for Data General Corp. minicomputers.

Given text files for input, Wordmap produces a listing of the files with line numbers and then generates an alphabetically sorted table of all symbols in the files, a spokesman said..

Along with each symbol in the table is a list of line numbers indicating where every reference to the symbol can be found, he said.

The package accepts "any form" of text including Fortran, Algol or Assembly language programs and English or other narrative documentation. Input files can be of any size and contain symbols of arbitrary length.

Wordmap suppresses any number of user-specified symbols such as Assembler op codes or compiler keywords, he said, and this results in a cross-reference table tailored to the user's requirements. The suppression facility allows Wordmap to be used for file comparison and spelling corrections, he added.

Global in Nature

The cross-reference listing produced by the package is global in nature: it can encompass a complete source file containing many subprograms, the spokesman said. Facilities provided with many compilers are limited to cross-referencing each program separately, he noted.

Output from this package includes page headers giving the date, time, file number and page number; output can be written to any file or device. No internal sorting methods are used, so Wordmap is not limited by memory, the vendor said.

The package functions on a minimum DG Nova needed for RDOS operations, as well as on larger Novas and Eclipses using that environment.

Wordmap is available on magnetic tape in RDOS-executable form for $950, IPTC said from 2462 Embarcadero Way, Palo Alto, Calif. 94303.

Directory Lists T/S Services

PHILADELPHIA — The looseleaf "Remotely Accessible Conversational Programs and Data Bases" directory contains descriptions of individual facilities offered by time-sharing vendors.

The $28 annual subscription includes bimonthly updates, according to the publisher, Gregory Research Associates, 1900 Greymount St., Philadelphia, Pa. 19116.

'Ramis' Gains Interface With IMS

PRINCETON, N.J. — An interface that provides users of the Ramis II and Ramis DOS information processing systems with fully automatic access to data bases under IBM's IMS and DL/1 has been announced by the Ramis vendor, Mathematica Products Group, Inc.

With the linkage, the Ramis nonprocedural language is used to issue the request while the standard Ramis report capability formats and displays the report, the vendor said.

Once the IMS data base is described to the system's internal dictionary, Ramis appears to process an IMS data base as though it were any other file.

The interface is efficient, Mathematica explained, because the appropriate sequence of DL/1 calls is issued by Ramis to retrieve the proper IMS segments; Ramis screening conditions, mapped into DL/1 logic, are used to provide qualified segment search arguments.

Batch Program

The interface operates as a batch program — in IMS terminology. It may be activated under IBM's TSO, effectively providing time-sharing access to off-line IMS data bases through the Ramis language, the spokeswoman continued.

The Ramis-IMS interface operates through a special module within the Reporting from External Files (REF) Ramis option. The module is currently available for $4,000 or $140/mo for 36 months.

The REF option can be purchased for $5,500. The basic Ramis II software needed to utilize the IMS interface costs $34,000 while the Ramis DOS packaging starts at $20,000.

Mathematica Products Group is at 14 Washington Road and can be reached through P.O. Box 2392, Princeton, N.J. 08540.

Siemens CPUs Get 'Easytrieve'

OAKBROOK, Ill. — Easytrieve, the information retrieval and data management system from Pansophic Systems, Inc., has been made compatible with Siemens 4000 series CPUs running under BS1000 or BS2000 environments.

The system was previously available only for IBM 360/370 hardware, a spokesman noted.

The Siemens hardware population is centered in Germany and Scandinavia; pilot versions of the Easytrieve package have been installed in both areas, Pansophic said from 709 Enterprise Drive, Oakbrook, Ill. 60521.

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'CPS' Gives Mathematical Program Support

HOUSTON – Management scientists, operations researchers and others with mathematical programming requirements may get the help they need, regardless of what large-scale CPU they have, with the Key Conversational Planning System (CPS) now available from Lowell-Welter Associates (LWA).

The package incorporates an array of capabilities for interactive or batch operations, including linear programming, nonlinear programming and dynamic programming, an LWA spokesman said. Key CPS runs on Fortran-compatible CPUs, he added.

Users are said to have complete control of logic and solution strategy in both modes of operation. Only two control commands – which can be entered from terminal or console – are needed to make any of 125 million combinations of conditional changes to, for example, a 75x150 representation, the spokesman claimed.

The user may also enter data, examine selected portions of the results, change the data, change the solution strategy and continue the run under new conditions until either additional modifications are indicated or the desired results are achieved, he said.

In a single job stream, several cases may be run as variations of the original base case and results from previous cases can be used to specify a new case and then modify it.

Key CPS is designed to efficiently process 150x300 representations interactively in 78K bytes of memory, the spokesman claimed.

The package costs $11,500 or $400/mo for a minimum of six months. Two days of on-site training and consulting, ordered concurrently with the licensing, costs $1,000 plus travel expenses.

Lowell-Welter Associates can be reached through P.O. Box 1597, Houston, Texas 77001.

PDP-11 Linked to 360/370

IRVINE, Calif. – The Distributed Processor Communications Module (DPCM) from Computer Solutions is used to move data between a Digital Equipment Corp. PDP-11/03 processing station and any other devices that meet binary synchronous communications protocol, including IBM 360/370s.

The addition of DPCM allows a stand-alone PDP-11 to be extended to access the resources of a large-scale CPU to which it has been attached, while retaining features developed for its local operations, a spokesman explained.

The DPCM user need not know teleprocessing "internals". to work with the package. Application programs communicate with DPCM through READ and WRITE calls, much as any peripheral is addressed.

The parameters in the calls are validated by DPCM, which alerts the user if an error is sensed. This early warning system "significantly" reduces check-out time during program development, the spokesman asserted.

The package features data transmission rates up to 9,600 bit/sec and transparency is provided for binary data. Both the Ascii and Ebcdic character sets are supported, including error-checking routines and retransmission for bad blocks.

A trace table may be optionally loaded which aids in the identification of teleprocessing problems. DPCM is time-independent of the user: All timing is controlled internally, according to the spokesman.

DPCM requires a PDP-11/03 with 4K words of memory, a DEC DUV11 parallel synchronous interface and a modem. The software, distributed as a Fortran-callable routine, costs $2,000, Computer Solutions said from Suite L, 17922 Sky Park Circle, Irvine, Calif. 92714.

Impact of ZBB To Be Discussed

WASHINGTON, D.C. – "Zero-Base Budgeting in the Federal Government: A Performance Audit of the First Six Months" will be the topic of a meeting here in late October, sponsored by the Federal ADP Users Group Special Interest Group on Zero-Base Budgeting and Automated Data Processing (SIG/ZBB/ADP).

Logan Cheek, author of *Zero-Base Budgeting Comes of Age*, will be the principal speaker at the session, on Thursday morning, Oct. 20, at the General Services Administration Region 3 Auditorium.

More information is available from Ken Burroughs, Chairman of SIG/-ZBB/ADP, c/o U.S. Chamber of Commerce, 1615 H St. N.W., Washington, D.C. 20062.

Energy Systems Listed

SPRINGFIELD, Va. – The $20 "Directory of Software Applications: Energy 1977" contains abstracts of 300 energy-related programs and reports in various computer languages. It is available under catalog #PB-264 200, in paperback or microfiche, from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

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For starters, we made the IGT-100 interactive. And truly intelligent. So it's fully capable of sharing the graphics workload with its host computer.

Then, we gave it a longer-lasting raster scan (TV) type display. To produce faster, brighter, flicker-free images. To give you sharper, black-and-white graphics. And to totally eliminate time-consuming image redrawing.

By contrast, most graphics terminals in the field today (with storage tubes) are about as far from interactive and intelligent as you can get.

Dependent is more like it. Because, typically, every graphic image — and every graphic manipulation — has to be carefully calculated, then transmitted, by the host computer to the waiting graphics terminal.

This whole routine not only puts a tremendous burden on the host computer (which usually has other jobs to do) but routinely requires lots of special software.

With storage tube type terminals, even routine manipulations like panning, zooming, selective erasing and message changing aren't very fast. In fact, the terminal operator is required to wait — up to several minutes — for a previous image to be completely erased and the second image to be tediously redrawn.

You get the picture, all right. But you'll get it faster with the new CalComp IGT-100. Because the IGT-100 is the quickest solution to these traditional problems. And easily, one of the most affordable.

Thanks to our built-in microprocessor, efficiency doesn't get lost in the shuffle.

A built-in microprocessor helps make the new IGT-100 one of the smartest graphics terminals you can buy. And one of the most efficient.

Coupled with 12K bytes of RAM memory, the IGT-100's microprocessor permits local storage, manipulation and completion of display functions. While providing an addressable memory matrix of 1024 X 680 bit positions. And a viewable matrix of 416 X 312 positions.

A keyboard with a 64 character ASCII set and an asynchronous RS-232-C interface are also supported by the IGT-100's microprocessor. Full or half duplex modes are switch-selectable. Along with asynchronous communication transmission rates from 300 to 9600 baud.

Give your new IGT-100 the whole picture and you'll never redraw it again.

Unlike most other graphics terminals, the new IGT-100 can store and manipulate images on a totally local level.

That means once an image is transmitted, you've got complete, autonomous control. All planning, selective erasing and message changing is instantaneously handled by the IGT-100's built-in microprocessor.

Even write-thru's, grids and zooms (2x, 4x, 6x and 8x) are displayed on the screen within 1/10th of a second.

And all without tying up your host computer. Or waiting several minutes for the image to be redrawn on a storage tube.

In fact, working with its built-in microprocessor, the IGT-100's longer-lasting raster scan screen will beat a conventional storage tube every time. Delivering a faster, brighter image at a flicker-free rate of 60 frames per second.

And that's a mighty pretty picture — any way you look at it.

Structured Maintenance — Part 2

Cost to Reshape User System Can Be Forecast

By Edward Yourdon
Special to CW

I would appreciate some feedback on the concepts of structured maintenance and some ideas on the guidelines needed to give it form as an approach to improved programmer productivity.

In last week's article, I suggested some of the things a programmer has to do to be successful and effective in reading "alien" code.

The other important part about reading programs is knowing what to look for. As many programmers know, most maintenance problems are associated with loops, decisions, logical expressions, subscripting, numerical operations, error-handling, data structures or input/output operations. For each of these areas, a number of specific "what-to-look-for" guidelines can be given.

Some of the other important pieces of structured maintenance are also the result of several years' experience with the structured development of new systems. For example, many of the "pilot projects" that have been used to demonstrate the effectiveness of structured techniques have been *conversions* of old systems to their new structured equivalents.

As a result, we now have a growing body of evidence with which we can estimate several factors:

- How much it costs to reanalyze, redesign and/or recode an existing system.

For example, it usually turns out that such efforts can be carried out at the rate of 20 to 25 debugged statements per day instead of the usual 10 to 15 statements per day. And it is reasonable to estimate, in the absence of any other evidence, that the new structured system will be approximately the same number of statements as the old version.

- How much more reliable the new system will be.

This depends largely on whether the old system has "settled down" or whether it continues to be unstable.

- How much more maintainable the new system will be.

In most cases, it is reasonable to assume that maintainability will improve by at least a factor of two, and possibly by as much as a factor of 10.

- How much more CPU time/memory will be required by the new system.

Readers are invited to comment on "structured maintenance," or any alternate technique they have developed to cope with the maintenance problem, by writing to Yourdon at Yourdon, Inc., 1133 Avenue of the Americas, New York, N.Y. 10017.

A reasonable "worst case" estimate is that a new structured system will require no more than 5% to 10% additional hardware resources. In addition, in a surprisingly large number of cases, the new system is considerably more effficent than the old system, since the new designers are, in a sense, able to stand on the shoulders of the original designers and see a better way of approaching the problem.

Program 'Restructuring'

Another structured maintenance technique involves the "restructuring" of existing programs. This, too, is based on techniques that were originally developed for structured programming. There are a number of techniques that can be applied either manually or mechanically to restructure code (see, for example, Brenda Baker's article in the January 1977 *Journal of the ACM*).

While there is considerable controversy about the merits of mechanically restructuring whole programs and systems (remember when we tried to mechnically convert 1401 Autocoder programs to Cobol?), there is no question that these techniques can be useful as a guideline for rewriting small chunks of existing logic that, in their present unstructured state, are impossible to understand.

All in all, structured maintenance is based largely on common sense and on techniques learned in structured programming and structured design. So why all the fuss about it?

Partly because, as Will Rogers once said, "Common sense isn't common." Remember, structured programming is still dismissed by some skeptics as trivial "common sense" — and yet it's evident that all of us need some rigorous, disciplined guidelines to ensure that we don't forget our common sense in the excitement of coding.

Also, it's evident that the structured design/programming movement has, to a large extent, been ignored by a large group of maintenance programmers. And who can blame them for ignoring discussions about the virtues of *future* systems when they're still responding to midnight phone calls about their *old* systems? So, it's time we developed a package of guidelines and techiques specifically tailored to the needs of such people — and that's what structured maintenance is all about.

Yourdon is chairman of the board of Yourdon, Inc., New York, and author/coauthor of several books on "structured" DP techniques.

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Six images that warrant some serious comparison shopping.
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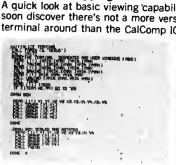
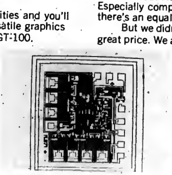
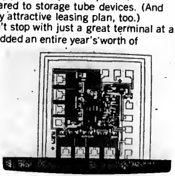

1. All alpha-numerics


2. All graphics.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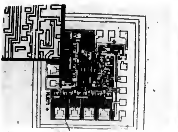
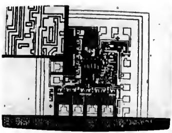
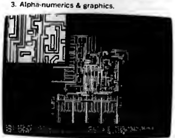

4. Graphics & View-window.


5. Alpha-numerics, graphics & View-window


6. Alpha-numerics, Graphics & View-window (with reversed-out section).

To begin with, the IGT-100's special three-way, split-screen design provides you with separate alphanumeric, graphics and view-window sections.

Plus the ability to independently view and control (i.e. panning, zooming, etc.) one or a combination of these sections simultaneously.

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The IGT-100's basic screen design maximizes the amount of data that can be displayed while providing you with six basic screen arrangements. Annoying superimposed messages have been totally eliminated.

It's about time someone came up with a screen that you can tailor to fit the job — instead of the other way around. And that's exactly what we did.

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Price shouldn't be the primary consideration when you're looking for a full-powered graphics terminal.

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Users Able to 'Own' Data In Distributed Data Bases

By Stephen L. Robinson
Special to CW

Data Base Corner

Every few months, it seems, there is a new technique, a new buzzword, guaranteed to revolutionize data processing. In the last few years we've heard about data base, intelligent terminals, bubble memories, microprocessors, EFTS and packet switching — to name but a few.

In part, the development and popularization of new techniques is a sign of the dynamic nature of our industry. The way we grasp for these new techniques is a sign of dissatisfaction with the status quo.

Consider data base systems. The concept has been developing for several years and data base packages sales are accelerating. However, all is not well in the world of data base.

Inherent in the development of a true data base system is a change in the philosophy of data management (see "Data Base Corner," CW, May 2). This change has not been very popular in many organizations.

Functional areas have lost "ownership" of their data. The concept of distributed data base systems, which would tend to restore some data ownership to functional areas, is therefore greeted with huzzahs that do not reflect all the technical and management problems associated with distributed data.

What Is It?

Let us first distinguish between distributed data processing and distributed data base; and then distinguish between types of distributed data base systems. (Note: the combination of distributed data base and distributed data processing is also clearly possible.)

Put very simply, a distributed data processing system consists of:

- A number of nodes (locations which may contain one or more input devices, computer configurations or output devices).
- The capability to enter a "job" at one node and have the "system" decide where to run the job (alternatively, the user may specify a particular node for the job).

Usually, a job submitted to a distributed DP environment carries with it a description of where its input data is to be found.

In a distributed data base system, a job is typically run at its own "home node," but the requisite input data is distributed at other nodes.

Data Base System Types

We should distinguish between two types of distributed data base systems. In a *static distributed system*, a prospective user must "know" which node has the data that is required. That is, a call for data must specify a node.

In a *dynamic distributed system*, a prospective user need not specify where the requisite data is to be found. Indeed, users will not know where the data is stored. The "system" will maintain a data dictionary of data element names, and aliases, and will generate data requests to the appropriate nodes.

Although I know of several operational static systems, I am not aware of any full-blown dynamic systems. The potential flexibility and adaptability of a dynamic system augurs well for the next five to seven years.

In the interim, static systems offer some interesting advantages over centralized data base systems. In particular, functional areas may once more "own" their data and they may organize their data to optimize their applications.

Following are some disadvantages of distributed data:

- Backup, recovery and restart are tougher problems.
- Synchronization of redundant data can be quite complex.
- Security/privacy issues are complicated.
- Performance of internode applications may degrade to the extent that functional areas may retreat into file system isolationism.
- The unknown always holds surprises.

There are, of course, many additional arguments — both for and against distributed data base systems. I would welcome reader descriptions of operational distributed data base systems — and especially reports on benefits and problems.

Robinson is an independent consultant, having recently organized S.L. Robinson & Associates, 517 N. Pennsylvania Ave., Morrisville, Pa. 19067.

'Plotall' Aids Graphics Work

AKRON, Ohio — The Plotall language developed by the University of Akron enables non-DP-trained people to use an IBM 360/370 to create a variety of graphics without getting involved at a programming level.

Plotall can be used to create line graphs, pie and bar charts, histograms and other "art work" that adds impact and understanding to verbal or written reports. The system supports four types of calendar and logarithmic axes, shading for pie and bar charts and up to six lines of title and text information, a spokesman noted.

Output Variable

The plotting software is basically designed to produce 8-1/2-in. by 11-in. output, but this can be adjusted — to larger or smaller dimensions — through control card entries prior to execution, he said.

Plotall is written in a combination of IBM's Assembler language and Fortran, for use with 360/370 systems equipped with Calcomp plotters. Access to all Calcomp plot routines is through individual subroutines provided to the user so that various graphics devices can be used.

License agreements to use Plotall, which functions under both OS/360 and OS/VS environments, cost $500 for educational institutions and $1,000 for industrial users.

More information is available from the Plotall Coordinator, University of Akron Computer Center, Akron, Ohio 44325.

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22 Director/Manager/Supervisor DP
23 Systeme Maneger/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
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51 Mfg Sales Representative
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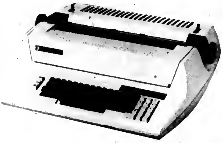

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A special feature of the Conference this year will be a major study on **Human Resources Programs: Costs and Results**—prepared at the University of Minnesota.

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The fee includes the cost of all luncheons, meeting materials and receptions. First participant—$425. Second participant from same organization—$400. Third or additional participant from same organization—$375 each.

Cancellations and Refunds. Confirmed reservations may be cancelled up to October 14. Participants who have not cancelled reservations on or before October 14 are subject to the entire fee. Substitutions may be made at any time.

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Program

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Sunday, October 30

7:00-11:30 p.m.—Registration

7:30-9:30 p.m.
Early Bird Welcome Party
Wine ,Cheese, and Music

Monday, October 31

7:30-9:00 a.m.—Registration

9:00-9:30 a.m.
InSci in Transition
Dale H. Learn, President, Information Science Incorporated

9:30-10:30 a.m.
Jobs—Who Should Provide Them And How
Edward Brooke, U.S. Senator, Massachusetts

10:45-11:45 a.m.
Critical Role Of Personnel Management In Todays Corporate Environment
Russell N. Freund, Vice President, Personnel, Philip Morris, Incorporated

12:30-2:30 p.m.
Lunch
From Space To Human Resources
Edgar D. Mitchell; President, EMCO; Apollo 14 Astronaut

2:30-5:00 p.m.
Concurrent Workshop Sessions

Legal Implications of Recent EEO Suits For The Corporate Community
Session Leader: Thomas Phalen, Esquire, Phalen

Using The Computer For Manpower Planning And Forecasting
Session Leader: Bob Flast, Manager, Human Resource Analysis, International Paper Company

Basics of Computerized Personnel Information

HRS In The Health Care Environment

Development Focused Performance Appraisal
Session Leader: Neil Thompson, Vice President, Blessing, White

Basics Of The General Retrieval System

The Politics Of Human Resource System Implementation
Session Leader: Alan Bell, Senior Associate, Applied Management Sciences, Warner-Lambert

System Upgrading Considerations In A Large Diversified Company
Session Leader: David Bowers, Programming Manager, AMF, Incorporated

Minicomputers And The Personnal Function

OnLine HRS And Banking
Session Leaders: Martin Benjamin, System Analyst, National Bank Of North America, David Witalis, EDP Officer, First National State Bank of New Jersey

The Data Analyzer
Session Leader: Sherman Drusin, Vice President, Program Products, Incorporated

The Think Tank Approach And The Human Resource System
Session Leader: Pat Coyne, Manager, Employee Relations and Personnel Systems, Amstar

5:30-7:30 p.m.
Reception
Cocktails, Music, Hors d'oeuvres

Tuesday, November 1

9:00-10:00 a.m.
Privacy As It Relates To Employment
Abraham Ribicoff, U.S. Senator, Connecticut

10:15-12:30 p.m.
Concurrent Workshop And Case Study Sessions

Establishing An HRS In Canada
Session Leader: Mike Villani, HRS Coordinator, Steinbergs Limited

HRS/Payroll Entry via Remote Terminals
Session Leaders: Walter W. Tullis, Director, Personnel information System, Fireman's Fund Insurance Company, Joseph Marzo, Senior Systems Analyst-Personnel, Fireman's Fund Insurance Company

New On-Line Capability With Your Batch HRS
Session Leader: Michael J. Parrella, President, Decision Strategy Corporation

Implementing A Payroll System
Session Leader: Lee Elliott, Manager Corporate Systems, Allendale Insurance Company

Skills Profiling And Career Management

Benefits: Employee Orientation Techniques
Session Leaders: Dorothy Needham, HRIC Manager, Foley's, Lorah Gough, HRS Project Manager, Foley's

Using The Computer For EEO Compliance And Affirmative Action Planning

Motivation And Organizational Behavior
Session Leader: Samuel B. Marks, Director of Government Services, American Management Association

Case Studies

Health/Safety Administration And The Computer
Harvard Graduate School of Business Administration

The Corporate HRS And Privacy
Harvard Graduate School of Business Administration

12:30-2:30 p.m.
Lunch
Human Resources Programs: Costs and Results
William Pyle, Ph.D, Director, Human Resource Research Programs, University of Minnesota

2:30-5:00 p.m.
Concurrent Workshop And Case Study Sessions

The Handicapped: Personnel Policies And Practices
Session Leader: Harold E. Krents, Esq., Surrey, Karasik & Morse

Computerizing Benefit/ERISA Information
Session Leader: Connie Combs, Assistant Vice President, Manager of Personnel Information Management, Valley National Bank

Successfully Managing The Human Resource Information Center
Session Leader: John Westenkirchner, Personnel Systems Administrator, Owens Corning Fiberglas Corporation

The Integrated Personnel/Payroll System
Session Leaders: C. Nolan Richardson, Director of Data Processing, Jerry Browning, Manager Systems and Procedures, Sonoco Products

Graphic Reporting For Personnel Management
Session Leader: Paul Kalbach, Vice President, Program Products, Incorporated

Implementing A Minicomputer-Based Personnel Information System
Session Leaders: Jim Fleming, Manager Personnel Information System, Philip Morris, Incorporated, Errol Johnson, HRS Coordinator, Philip Morris, Incorporated

Development Of A Personnel Automation Plan In The Banking Industry
Session Leader: Gregory MacNeil, Assistant Vice President, Chemical Bank

Human Resource And Cost Accounting The Real Cost of Compliance
William Pyle, Ph.D, Director, Human Resource Research Programs, University of Minnesota

Case Studies

Health Safety Administration And The Computer
Harvard Graduate School of Business Administration

The Corporate HRS And Privacy
Harvard Graduate School of Business Administration

Wednesday, November 2

9:00-10:00 a.m.
What To Expect From The OFCCP As It Enforces The Law
Weldon Rougeau, Director, Office of Federal Contract Compliance Programs

10:15-11:15 a.m.
The Role Of Computer Technology In Airforce Human Resources Management
Brigadier General H. L. Emanuel, Deputy Assistant DCS/Personnel For Military Personnel

12:00-2:00 p.m.
Lunch
The Human Dimension Of Affirmative Action
Harold E. Krents, Esq., Surrey, Karasik & Morse

2:00-4:30 p.m.
Concurrent Workshop Sessions

Minicomputers: Pros And Cons

Use Of IMS In Personnel/Payroll Systems
Session Leader: Douglas J. Cotts, Director, Data Base Assistant Team, Automated Concepts, Inc.

New Uses For The Human Resource System
Session Leader: Kirk Honold, Corporate Manager, Personnel Systems, Baxter Travenol Laboratories

Medical/Health/Safety
Session Leaders: Curtis D. Bowden, Manager Safety and Health, Florida Steel, Phil Dandridge, Manager, Personnel Administrative Services, Springs Mills

Further Uses Of The General Retrieval System

Controlling Manpower Costs In Banking —Forecasting, Analysis And Implementation
Session Leader: Judy Nelson-Moore, Assistant Personnel Officer, First National Bank of Denver

Bsnefit Statements
Session Leader: Cathy Lowenbraun, Insurance Manager, Kane-Miller Corporation

Management Interaction With HRS
Session Leader: Jesse Romer, Personnel Officer-HRS, United Virginia Bankshares, Inc.

Security Considerations Of A Personnel System

The Personnel System In A Highly Decentralized Industry
Session Leader: John Gandolfo, Manager, Personnel Systems, ARA Services, Inc.

Implementing Point Of Sale Input Mechanism For Hours/Earning
Session Leader: Mal Hightower, Manager, Systems/Programming, U.S. Specialty Retailing

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School Days

Software Key To Sessions In New York

NEW YORK — "Software: Project Management, Tools and Techniques, New Developments" is the title of a two-and-a-half day conference to be presented by the American Institute of Industrial Engineers (AIIE) at the Hotel Roosevelt here, Oct. 17-19.

The meeting will include plenary sessions, the first day; workshops examining the impact of evolving technology, the second day; and a panel discussion analyzing software quality and conflicting trends.

Registration fees is $265 for AIIE members and $295 for others, with "team" discounts available. The seminar is being run by Management Education Corp., P.O. Box 3727, Santa Monica, Calif. 90403.

Career Concerns Covered in D.C.

WASHINGTON, D.C. — "How to Succeed in the World of EDP," a seminar described as the premiere presentation of the special interest group on career counseling of the Association of Computer Programmers and Analysts (Acpa), will be held this coming Saturday, Sept. 24, at the Quality Inn Central, Arlington, Va.

Topics ranging from individual career development and purpose of the resume to interview techniques will be considered during the working sessions. Jack Stone, author of *Computerworld*'s "Human Connection" column, will speak at lunch.

Registration fees now are $40 for Acpa members and $55 for others, with a $30 fee for students, the association said. Registrar is Linda Miller, 7708 Hanover Parkway T-3, Greenbelt, Md. 20770.

System Sessions Set in 2 Cities

ROCKVILLE, Md. — Effective Data Systems Development will be the subject of a three-day seminar by Barnett Data Systems in Houston and in Washington later this year.

The $425 course will be in Houston on Oct. 25-27; in Washington on Nov. 7-9 and again on Dec. 5-7. A one-day briefing keyed to the "problem definition" portion of systems work will be presented in each city, for $155/person, the day after the longer seminar.

Barnett Data Systems is at 19 Orchard Way North, Rockville, Md, 20854.

Topic: Tuning

DELRAN, N.J. — Datapro Research Corp. has scheduled a seminar on "Computer Performance Measurement: Tools and Techniques for Increased System Productivity" in four cities this autumn.

The seminar will be in Washington, D.C., Oct. 24-26; in San Francisco, Oct. 31-Nov. 2; in New York, Dec. 7-9; and in Chicago, Dec. 14-16. Cost is $425 for current Datapro subscribers and $475 for others, the company said from 1805 Underwood Blvd., Delran, N.J. 08075.

Management To Be Theme

NEW YORK — Each registrant attending the "Management Skills for the Systems Professional" seminar in late October will be assigned to work with a small group of other managers who have similar backgrounds and expertise, according to the American Management Association.

By working out solutions to simulated problems and presenting their findings to the entire class, participants should learn ways to organize the systems department, to interview potential employees, to train the systems team, to allocate personnel and set priorities, a spokeswoman said.

Running from Oct. 31 through Nov. 4, the course costs $610 for AMA members and $700 for others. The association is at 135 W. 50th St., New York, N.Y. 10020.

HP and College To Teach APL

FULLERTON, Calif. — Four independent but related seminars will be offered here late this month and in October by Orange Coast College and Hewlett-Packard Co.

The seminar schedule includes "A Manager's Hands-On Guide to APL on a Mini," Sept. 20; "Hidden Computer Treasures for Financial Executives," Sept. 27; "Engineering and Scientific Applications," Oct. 4; and, "Far Out APL," Oct. 11.

Sessions start in late afternoon and continue until 10 p.m. at the Hewlett-Packard Data Center here in Fullerton. The $48 registration fee for each seminar includes a buffet dinner, the APL seminar coordinator said from 1430 E. Orangethorpe Ave., Fullerton, Calif.

Productivity Ideas Offered

McLEAN, Va. — Courses on DP productivity improvement are being offered by Johnson Systems, Inc. this fall.

Johnson schedules three consecutive courses each week, including one on the basics and another on advanced techniques for use of the company's Job Accounting and Reporting System (Jars) package.

The third course is not Jars-oriented. Topics include Computer Performance Management, Hardware/Software Planning and Evaluation and Design and Implementation of a Data Center Chargeback System.

The Jars courses are included in the $295 fee charge for single courses, the spokesman noted from 8400 Westpark Drive, McLean, Va. 22101.

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Seminars on Production Planning Inventory Control Systems will be given by Management Technology Incorporated in Cincinnati, Ohio on Wednesday, September 28 and in Grand Rapids, Michigan on Wednesday, October 12. Reservations are necessary. There is no charge to attend. For information contact Jerry Carter at (616) 531-5397 or write M.T.I., P.O. Box 8471, Kentwood, Mich. 49508.

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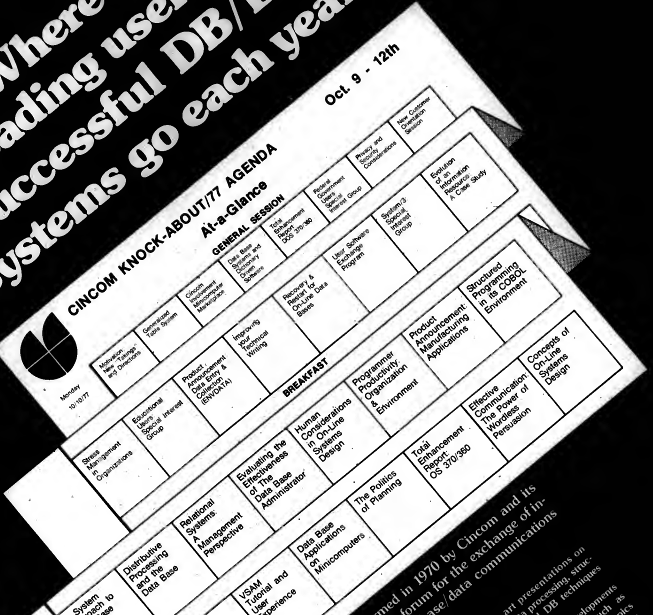

CINCOM KNOCK-ABOUT/77 AGENDA

At-a-Glance

Oct. 9 - 12th

Monday 10/10/77

GENERAL SESSION

Motivation: New "Takings" and Directions

Generalized Table System

Cincom Involvement Minicomputer Marketplace

Data Base Systems and Dictionary Driven Software

Total Enhancement Report DOS 370/360

Federal Government Users Special Interest Group

Privacy and Security Considerations

New Customer Orientation Session

Product: Announcement Data Entry & Collection (ENVDATA)

Improving your Technical Writing

Recovery & Restart for On-Line Data Bases

User Software Exchange Program

System/3 Special Interest Group

Evolution of an Information Resource: A Case Study

BREAKFAST

Stress Management in Organizations

Educational Users: Special Interest Group

Evaluating the Effectiveness of The Data Base Administrator

Human Considerations in On-Line Systems Design

Programmer Productivity: Organization & Environment

Product Announcement: Manufacturing Applications

Structured Programming in its COBOL Environment

The Politics of Planning

Total Enhancement Report: OS 370/360

Effective Communication: The Power of Wordless Persuasion

Concepts of On-Line Systems Design

Wednesday 10/12/77

A System Approach to Data Base Design

Distributive Processing and the Data Base

Relational Systems: A Management Perspective

Data Base Applications on Minicomputers

Product Announcement: On-Line Program Library Maintenance System

Banking Users: Special Interest Group

VSAM Tutorial and User Experience

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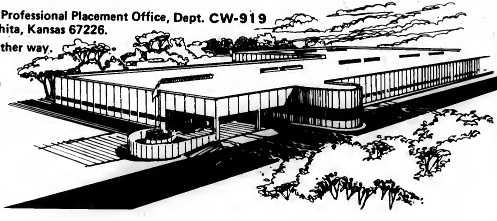

But PADs are Coming

X.25 Seen Awkward for Data Net Users

By Ronald A. Frank
CW Staff

TORONTO — The migration to packet switching is "particularly awkward" for data communications users because terminals adapted to the X.25 protocol standard are no longer operable on private lines or switched circuits, according to Louis Pouzin of France.

Speaking at a recent Conference here, Pouzin, for the French research institute IRIA, said the recent adoption of X.25 as a packet network standard has led computer terminal suppliers to introduce a variety of network architectures in answer to IBM's Systems Network Architecture (SNA).

"Every manufacturer is developing systems designed to tie up customers in a maze of specific products, all cunningly interdependent," Pouzin said.

The X.25 protocol allows setting up and clearing connections through virtual circuits, The virtual circuit is like a switched connection except that it is virtual. In terms of service characteristics, X.25 imposes transit delays typically between .5 sec and 1 sec; fixed packet formats; transmission procedures; several connections multiplexed on a single access circuit; and no error conrol end-to-end, Pouzin said.

'Total Incompatibility'

The X.25 protocol exhibits "total incompatibility" with previously defined public data networks, and the number of deficiencies identified with it "foretells a substantial revision," he said.

Since X.25 does not fit any existing equipment, it "is not very saleable." Because of this, the carriers have introduced the Packet Assembler/Disassembler (PAD), which is implemented in a terminal controller. Terminals supported by the PAD controllers must be either start/stop type operating at 110 or 300 bit/sec and must use Ascii code, Pouzin said. This year will be the year of the PAD within CCITT, with a strong drive to get a specification approved, he predicted.

On the other hand, the subject of X.25 consistency with other data communication services will not be given much attention within the standards-making body this year, he said.

The adoption of X.25 by the CCITT was the result of "worldwide salesmanship and rough pushing" which led to unanimous approval, although no votes were recorded, Pouzin said.

The standard was approved through the combined efforts of Bell Canada, Telenet Communications Corp. and the French and United Kingdom postal administrations. The X.25 protocol is basically a "carbon copy" of a procedure designed by Telenet for its own use and Telenet was the most influential carrier favoring its adoption. This was because Telenet is the only carrier operating in the packet switching area without cross subsidization.

Describing Telenet as a specialized carrier in the U.S., Pouzin said it does not offer a "full range of consistent public services." But turning a Telenet product into a CCITT recommendation "is certainly a highly prized reward for the company and explains why packet-switching services are out of context with other public data communications services in other countries," he said.

Telenet provides everything either as part of its network or as software packages for customer equipment. But the carrier is not selling a virtual circuit service. Instead, it is offering remote terminal handling and procedure conversion.

The next logical step will be a complete service for users in one of four one possible forms:

- Computer manufacturers provide converters and remote controllers to go with them.
- Entrepreneurs build and sell/rent converters and remote controllers.
- Entrepeneurs put up all necessary gear and sell composite services based on public data communications services.
- Carriers provide composite services.

The carriers will be dependent on the vendors' willingness to put X.25 interfaces in their products. The carriers would like to impose the network terminal access methods on the manufacturers so that "the whole terminal-handling business falls under carrier control," Pouzin said.

Users are realizing that building a system out of heterogeneous components may result in considerable economies. But in order for this to happen, common protocols are needed and boundaries of responsibility must be clearly defined, he said.

Terminal-Based Turnkey Helps Pharmacy With Recordkeeping

FORT WORTH, Texas — Pharmacists are discovering that a computerized communications network can provide a new prescription for an ailment as old as drug stores themselves.

That "ailment" is an overabundance of repetitive, routine, time-consuming tasks like typing prescription labels, storing patient profiles and family records, updating inventories and drug prices and processing Medicare and Medicaid paperwork.

The remedy is a $20,000 turnkey minicomputer system called "System 31", which features a mini-CRT terminal/keyboard by Informer, Inc. of Los Angeles.

Operated by V.C. Brown, Inc. of Fort Worth, the system serves nearly 100 pharmacies, and Brown officials claim the market is growing. The system, which has taken six years to develop, incorporates a Computer Automation, Inc. LSI-2 minicomputer, a Centronics Data Computer Corp. and the Informer Models 301 and 302 mini-CRT display screen and keyboard.

Dalton Carter, who owns Carter Pharmacy in Fort Worth, is so proud of his computer he advertises it in the Yellow Pages. His ad reads "Complete computerized prescriptions records for major medical and income tax."

"The first year I had the computer," Carter said, "I watched closely to see if it really would pay for itself. In that first year, I found that it saved me $11,500 by just keeping up with wholesale price increases on refills, not to mention the relief on handling the paperwork for Medicare and Medicaid."

Carter, whose small pharmacy fills an average of about 100 prescriptions a day, said he had four clerks to handle the third-party paperwork before he began subscribing to the computer system. Today, he employs two clerks.

"It's obvious that I can take two salaries and pay for the computer," he said. "When I came into the business, wholesale drug prices hadn't changed in 40 years. Now, with everyday's mail, we get price changes. And with welfare, etc., you have such a low margin that you've got to grab every penny to make a profit."

Carter said the V.C. Brown System 31 wouldn't be the same without the small Informer terminal. "I love it," he said. "It's obvious why. The terminal takes up very little space. There's no point in its being any bigger than it is. You've got all the information you need, and no more."

Bob Glenn, Brown's national sales manager, said one of the mini-CRT terminal's advantages is its smallness. "You're talking about counter space that the pharmacist uses for everything," he explained. "Informer's terminal is 6 by 20 in. and has a pedestal-mounted six-in. CRT screen that stands 10 in. tall. It weighs 10 pounds and is easily moved around."

(Continued on Page 45)

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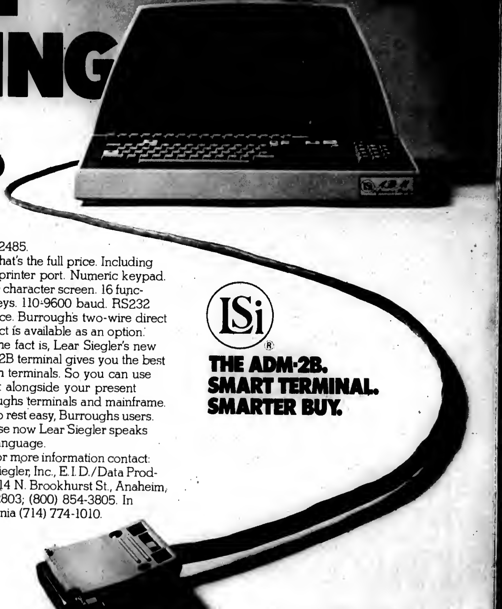

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Clients Do Own Banking With Wall-Mounted 'Teller'

S. LAWRENCE, Mass. — Bay State National Bank has installed an IBM self-service banking terminal at its Winthrop Ave. branch here.

Called Instabank, the IBM 3614 consumer transaction facility has been installed in the branch's outside wall, permitting the bank's customers to make the following transactions:

- Withdraw cash in $5 and $20 denominations from savings or checking accounts, up to a daily limit of $250 from either account or a combined total of $350.
- Make deposits to checking or savings accounts.
- Transfer money from one account to another.
- Make installment loan, mortgage, Master Charge or club payments.
- Obtain current checking or savings account balance.

Bay State National Bank has installed an IBM 3614 consumer terminal at its Winthrop Ave. branch in South Lawrence, Mass., as part of an IBM 3600 finance terminal system.

"Instabank provides customers with the convenience and privacy of 24-hour banking every day," according to assistant vice-president John C. Hersey.

To initiate a transaction on the 3614, a customer inserts a plastic magnetic stripe identification card — called Instacard — into the terminal, which is connected to the bank's central IBM 370 CPU. After the card is validated, a display panel instructs the customer to enter a secret code number at the keyboard.

Then, guided by messages on the display panel, the customer presses a series of keys to indicate the transaction and its amount. After each withdrawal, the system debits the customer's account and returns the card.

When depositing funds or making loan payments, the customer presses the appropriate keys and inserts an envelope — containing payment documents, checks or cash — into a covered deposit slot. Customers also can make payments by inserting an envelope containing a payment stub or coupon and keying instructions to deduct funds from their checking or savings accounts.

The bank also has begun using teller-operated terminals in all 10 of its branches. All units are part of the IBM 3600 finance communication system.

The terminals include keyboard display units and passbook/document printers linked to the central computer, the bank said.

Spectron Devices Gain Send/Receive Option

MOORESTOWN, N.J. — The Spectron Corp. has introduced a send/-receive option for its T-511 tape unit.

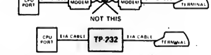
Data recorded on tape by a Spectron Datascope D-601 or on a T-511 can be transmitted between two T-511s equipped with the option.

Data can be sent between sites in simplex operation, a spokesman said.

The purchase price of the option is $800; previously delivered units can be retrofitted at a cost of $960, the firm said from 344 New Albany Road, Moorestown, N.J. 08057.

TP-232 MODEM SIMULATOR

The TP-232 Modem Simulator replaces a pair of modems in local, in-house applications, as shown below. With its wide variety of strap selectable options, this unit is a versatile tool for system check-out as well as an economical replacement for a modem pair



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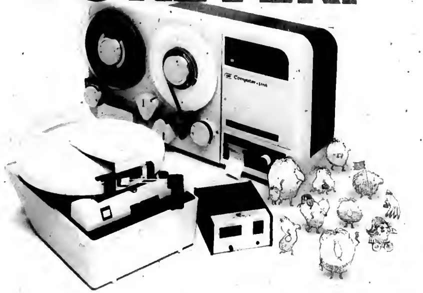

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More Hookups Under Way

SNA-Based Net Links Mexican Bank Branches

Special to CW

A sophisticated tele-information network based on IBM's Systems Network Architecture (SNA) concept (and utilizing Vadic-licensed 1,200 bit/sec and 2,400 bit/sec CCITT-compatible modems) is now in use at Multibanco Comermex of Mexico City. The system places Multibanco Comermex in the lead within the Mexican banking industry for farsighted uses of data communications technology.

A desire to provide better daily services motivated the bank's directors to implement a comprehensive computer service expansion plan.

A fundamental requisite was a greater integration within the bank's offices throughout the country over a reliable data transmission network.

Once such a network was established, Multibanco Comermex decided to install backup systems both at the computer and at the telecommunications equipment levels.

To obtain the high levels of efficiency required, the use of distributed intelligence technology was supported by a high-level synchronous communication protocol.

One of the bank's objectives was to use modems manufactured in Mexico. It contacted the General de Telecommunicaciones S.A., who supplied modems manufactured in Mexico under license from Vadic Corp.

Two types of modems were licensed by Vadic: the VA-1200L CCITT V.23-compatible 1,200 bit/sec modem; and VA-2400L CCITT V.26-compatible 2,400 bit/sec modems.

The network is supported in a data processing center (CPD) and a data telecommunications center (CTD) located in Mexico City.

Multibanco Comermex also offers a consultation and protection telephone service to remote and branch offices, in case of catastrophic failure, such as power outage, at a remote office.

Installation of controls for remote terminal management of provincial branch offices has been planned, and integration of remote offices in the country's interior has already been started.

Network Configuration

The Multitronic network, based on the IBM 3600 financial system, includes an IBM 370/125, a 370/135 CPU and two IBM 3704 communication processors to provide redundant on-line operation.

Normally, the 370/135 is used on the first and last days of the week and on the 15th and 30th of each month (the bank's pay days).

Each 3704 communications processor is capable of managing the entire network, because of data divider bridges, following the VA-2400L modems.

The bridges accept four IBM terminal controls, backing up both the 1,200- and 2,400 bit/sec modems, which are housed in 16-channel multiple mounting racks.

The telephone lines are backed by a half-duplex line which is normally connected to the CCD in case of emergency.

Because of multipoint operation, the network can maintain eight branch offices with each 3601, of which there are currently nine in the system.

Emergency measures may also be taken to prevent any one branch in the multidrop loop from blocking the other branches in the same loop.

At present, the system as 46 branches, most of them in the metropolitan area of Mexico City. The system contains 140 data terminals linked by the Vadic-licensed modems.

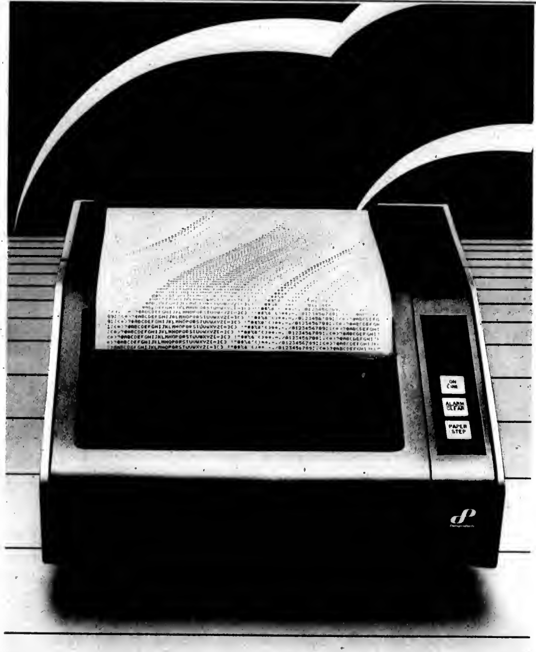
The 1,200 bit/sec modems are used at the branch level, while the 2,400 bit/sec modems are used at a higher level. The system is used for debits, credits and inquiries on checking and savings accounts and loans.

Software used is IBM's Virtual Telecommunications Access Method/ Extended Telecommunications Module (Vtam/EXTM) in the 370 CPUs Network Control Program/ Virtual Storage NCP/VS in the 3704 communications processors; and Synchronous Data Link Control (SDLC) protocol for data communications. SDLC is compatible with the International Standards Organization's (ISO) proposed High-Level Data Link Control (HDLC), which has been adopted by France, Canada and other countries as a base for their public data networks.

Informarica y Telecommunicaciones S.A. is also involved, developing an efficient, simple system for switching to back-up equipment, plus a diagnostic and control system with a display panel to inform the CTD operator of the network status and to provide control of back-up switching from the panel.

Analog signal levels, noise levels on the telephone lines and digital interface signals from the 1,200- and 2,400 bit/sec modems can be monitored.

The Multitronic network reportedly is the first of its kind in Latin America to employ SNA. With this architecture, Multibanco Comermex achieves better integration with its finance group and can offer better service to clients and officials alike.



Services Firm Credits Net With Revenue Rise

SILVER SPRING, Md. — Because it converted to a national data communications network, a remote computing services firm here will double its revenues during the next year, the company's president predicted.

Dialcom, Inc., began using the Tymnet, Inc. communications network after executives in the computing services firm realized they wold have to make Dialcom's services more accessible to its customers, which include government agencies, financial institutions and businesses.

"Tymnet offered the only network service which met all our criteria," Dialcom president Robert F. Ryan recalled.

To save money, Dialcom in the past installed local dial-up lines in only a few high-density cities like Baltimore, New York, Philadelphia, Minneapolis and Pittsburgh. Because of rapid company growth and customer demand for access in other U.S. cities, however, the firm's management conducted a study of national network common carriers in early 1976.

Criteria for the selection of a network included the ability to base the network at Dialcom's computer facilities here, to provide Bell 113B-compatible transparent hookups and to cover many major U.S. metropolitan areas.

Even more important, the company demanded reliability and performance to ensure a level of quality acceptable to Dialcom's network customer base, Ryan said.

"An important reason we selected Tymnet," he continued, "was its history and experience with our industry. Because Tymnet has conveyed the services of Tymshare, Inc., for many years, it was my feeling that Tymnet would relate to the problems of a time-sharing concern better than the other common carriers."

Node Replaced

During December 1976, when Dialcom began using the Tymnet operation; surging volume forced the company to replace the original network node — a Varian 620L, wth 30 ports — with a Varian V72, 62-port configuration. Management attributed the change to increasing customer additional access points. Approximately 50% of Dialcom's customers draw usage in more than one location.

The network allows Dialcom to compete on a national level in additional areas of marketing like data collection and accessing of common data bases for large multi-city firms. By using Tymnet, Dialcom believes it can better serve the associations and corporations utilizing its software products, Ryan noted.

Dialcom's most widely offered services include a word processing correspondence. tracking system and Federal Assistance Programs Retrieval System for state and local government agencies. It also offers software packages for business, accounting and engineering.

Dialcom does its processing at its dual-computer facilities here, which house four Honeywell 1648 time-sharing systems. The company plans to install an additional Honeywell 1648 system this year.

The company's 1976 estimated revenues will exceed $1.5 million, an increase of approximately $500,000 over the previous year.

Pharmacy Using Turnkey System

(Continued from Page 41)

System 31's disk memory stores about 70,000 accounts, enough to last the average pharmacy two years without purging. When a customer comes in for the first time, a druggist enters information like doctor's name, customer's name and account number, code of directions, allergies, drug name, quantity, price, cost, number of refills, predetermined fees and number of lables to print into the system.

When an account is established, a refill or new prescription takes only a few seconds.

Among its other functions, the system checks drug prices to ensure they are current; checks refill numbers to be sure the authorized number of refills have not been exceeded; updates family records; creates billing files for third-party payment; and prints prescription labels.

Another advantage of the CRT terminal is the ability to program private reminders on various. customers, Glenn said. "You have all sorts of people walking into pharmacies," he explained. "You may only want to accept cash from some. Others may be suspect drug abusers or shoplifters. You can get a private message on the screen whenever that customer's number comes up and it will never be printed anywhere else that it could cause you embarrassment if it got into the customer's hands."

Carter described the network as nothing more than a sophisticated file clerk and filing system," which is exactly what he said his pharmacy needed. "Previously, we had two manual file systems, and if you had 10 or 15 refills on a prescription, you thumbed through them so many times you couldn't read the number," he recalled.

"Now, the pharmacist just takes the label off the printer and it's legible, the information is there in the same form every time and the drug prices are current."

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Infoton Adds Two CRTs

BURLINGTON, Mass. — Infoton Corp. recently introduced two CRT terminals. The 1200 is a Teletype Corp.-compatible display terminal with standard bottom-line entry and full-screen entry operating modes.

Features of the terminal include a 1,920-char. display in a 9 by 9 dot matrix format, RS-232C and current loop interfaces, 16 switch-selectable transmission rates from 50- to 19,200 bit/sec and a capacitor scan detachable keyboard, according to an Infoton spokesman.

Command functions of the 1200 enable X/Y cursor addressability, erase line or screen, and keyboard lock or unlock, he said.

Options available include upper/-lower case printing, a printer interface, answerback, numeric keypad, function keys and non-scroll page mode of operation, Infoton noted.

The Model 1400 is said to be a multifunction CRT terminal which utilizes the full Ascii code set and is microprocessor based.

Features of the terminal include all those standard on the 1200, as well as character or block transmission, cursor control cluster, a numeric pad and editing capability, the spokesman noted.

Additional command functions on the 1400 include cursor sense, reverse video, and underline field.

The 1200 costs $1,195 in its basic form; and the 1400 is priced at $1,595, the spokesman noted from Second Ave., Burlington, Mass. 01803.

Microprogrammed System

CRT Does Publishing Jobs

CORNWELLS HEIGHTS, Pa. — Delta Data Systems (DDS), has introduced a video display terminal that its manufacturer claims minimizes errors in text processing applications. Dubbed Delta 4300E, the microprogrammed terminal incorporates a 4K-char. memory expandable to 8.5K char.

Designed exclusively for organizations like newspapers, publishing houses and other communications firms, the terminal provides text-manipulation features that include automatic word wrap, automatic ragged right sentence and paragraph justification and automatic justification of new insertions, the firm said.

In addition, four automatic search modes are possible including searching test for a specific word or word string; search and replace each occurrence in text with a new word or word string; search and replace upon request; and search and delete each occurrence in text of a specific word or word string.

Moves, Copies Text

Other features include the ability to move/copy/delete any defined text from the terminal's memory. The unit has an automatic carriage return. Memory preservation prevents loss of data and signals the operator when a character is added or inserted into a full memory, DDS added. To help conserve memory, a data·compression code eliminates trailing spaces.

Like the firm's Delta 4000 microprogrammed video display terminal, the 4300E offers a 128 upper/lower case character set scroll up or down, full tab/clear control, end of data tab and protected text (format) control. Communications speeds up to 9,600 bit/sec are possible with the unit and a serial printer port for hard copy records is also available as an option.

Display Modes

Four display modes — normal, reverse, blink and reverse with blink — aid text processing jobs by calling attention to specific information on the screen, DDS said.

Used with a printer, the terminal can be used to prepare documents at insurance companies and financial institutions, research organizations and government agencies of all kinds.

The terminal displays 25 lines of 80 characters each. An exclusive paging feature displays all the characters in memory — regardless of the number of lines — in any format, without computer memory or regard to the number of lines of information transmitted, DDS claimed from Woodhaven Industrial Park, Cornwells Heights, Pa. 19020.

WUI to Start Serving Japan

NEW YORK — Western Union International, Inc. (WUI), a unit of WUI, Inc., and Kokusai Denshin Denwa Co., Ltd. (KDD), the international telecommunications entity of Japan, have agreed to begin operations for private line and other services. WUI will apply to the Federal Communications Commission soon for the necessary authority, a spokesman said.

Japan was the only major country not served directly by WUI. KDD provides all international telecommunications services, telephone and record, between Japan and the rest of the world.

KDD and WUI will offer private leased-channel services to commercial and government users via both cable and satellite.

Private leased channels constitute WUI's second largest service area, next to Telex, which is not covered by WUI's agreement with KDD. KDD and WUI are also currently exchanging views on a future data transmission service between Japan and the United States, WUI said.

OCR SAVES MONEY

How Westinghouse Saves Over $10,000 A Month With OCR

Westinghouse Credit Corporation's business is financing at both retail and wholesale customer levels. Before OCR, credit applications for computer input were keyed from forms manually generated at a multitude of field offices.

Westinghouse's George Jordan was instrumental in replacing this costly and cumbersome keypunch operation with an Optical Business Machines Laser OCR-One optical character recognition system and seven newly designed forms. About 25,000-30,000 of these forms are scanned every month. The result . . . the keypunching staff has been reduced by over 50%. The savings from this alone amount to about $10,000 a month! More than that, Westinghouse Credit has reduced their reporting time by three days and has achieved much better control of their money.

For information on how you can cut data entry costs with the Laser OCR-One system, contact

Billy Graham
Vice President/
Marketing

Optical Business Machines, Inc.

804 West New Haven Avenue
Melbourne, FL 32901
(305) 727-1774

I'd like more information about the Laser OCR-One

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☐ have a salesman call me

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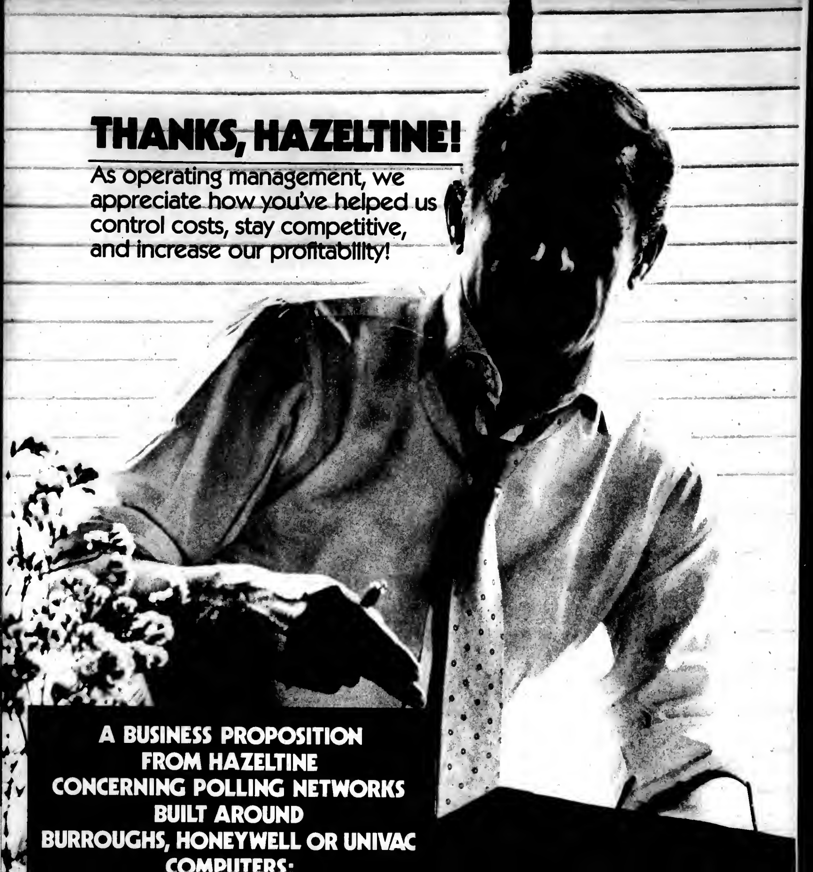

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Helps Assure Data Security
Bank's Film Stops Developing Problem

HALIFAX, Nova Scotia — The Bank of Nova Scotia, headquartered here has found an inexpensive solution to a potentially expensive problem — data security.

The problem was that confidential information shown on CRTs at teller stations could be seen by any customer standing in line.

"It wasn't long after our computer terminal was installed at a pilot branch in March 1976 that we realized we had a problem," according to George W. Tompkins, manager of implementation coordination. "I could read your business and you could read mine very easily."

This presented an undesirable situation since it varied with the traditional banking code of maintaining the security of customer records. "Because we were pioneers in this particular program, we had to find out for ourselves that a problem existed," Tompkins explained.

It wasn't the fault of the terminals, IBM 2970s, according to A.D. MacMillan, projects manager for corporate branch operations. "It was simply a case of our having a unique requirement for a product designed for the industry at large. The problem was made more acute by our approach of using rotating pedestal bases for the terminals, rather than mounting them on the counter facing the teller," he said.

"The pedestals are set back from the counter and can be turned from one teller to another. When the unit faced a teller, information displayed on the screen was visible to anyone in line at that window — the person's name, financial data and any messages.

"We began looking for remedies and obtained some quotes, but we had to move quickly. We were scheduled to have 440 of our 966 branches on the system by mid-1977 and couldn't afford to have that unsatisfactory situation cropping up in branch after branch.

"Meanwhile," he added, "our instruction to the branches was 'Do not turn the terminals' — a restriction that proved awkward at times, but we had no choice."

The problem was solved at a cost of less than $3 per terminal with sheets of light control film from the 3M Co. The film, a thin plastic sheet incorporating microlouvers, works like a tiny venetian blind to reduce glare, control light, improve contrast and control the viewing angle.

When placed in front of a lighted display, it directs light into a controlled viewing pattern and blocks out light from external ambient sources.

Film louvered at 0° restricts visibility to direct frontal viewing. Film louvered at 45° is used in certain branches where a cashier/teller system is employed; in those locations, terminals face the customer directly, but the angle of the louvers con-

(Continued on Page 56)

Pedestal-mounted terminals serve two tellers; this arrangement caused some of the data security problem faced by the bank.

Bits & Pieces

Cleveland Society Sets Measurement Workshop

CLEVELAND — The Cleveland Engineering Society will hold a two-day workshop on computer measurement here Sept. 29-30.

The workshop, which will be directed by Donald C. Harder and David S. Hubbert, is designed for computer management personnel and capacity planning analysts.

The cost of the workshop is $335, which includes luncheons, coffee breaks and all materials. Additional registrants from the same firm will be charged $300; a 10% discount is available for teams of three or more persons from the same firm.

Registration information is available from the society's Education Office, which can be reached by telephone at (216) 361-3100. The society is at 3100 Chester Ave., Cleveland, Ohio 44114.

Brush Removes Static Charges

HILLSDALE, N.J. — The Texwipe Co. has introduced a static eliminator brush that reportedly eliminates the static charges that build up as a result of the movement of paper in hard-copy output devices.

The brush is a conduction-type device that collects static charges and "bleeds them to ground." The brush requires no chemical renewal and maintenance is nonexistent, according to the company.

The brush costs $27 from the firm in Hillsdale, N.J. 07642.

Pericomp Hikes Crimper Price

NATICK, Mass. — Pericomp Corp. has increased the price of its magnetic tape crimper from $28 to $30.

The price hike is a result of increased production costs, a spokesman said from 14 Huron Drive, Natick, Mass. 01760.

Savings & Loan Goes In-House After 10 Years With Services

Special to CW

NASHVILLE, Tenn. — After relying on computer service companies for 10 years, the Fidelity Federal Savings and Loan Association here recently opted for in-house DP. The move was prompted by a desire to save money and increase management's flexibility and responsiveness to a changing financial environment, according to Garnett Cothern, vice-president for computer operation.

"Just a few years ago we determined that we couldn't justify the cost of operating our own computer," he said. "Now it would cost us more to utilize an outside service.

"Furthermore, we have more flexibility, and we can prepare for electronic funds transfer, NOW accounts, variable rate mortgages and other likely trends — at our own pace," he added.

Fidelity has 10 branches supplementing the services offered at its 12-story main office in downtown Nashville. The branches extend Fidelity's service to a four-county area in mid-Tennessee. Another two branches are scheduled to open soon.

Based on his experience, Cothern believes associations smaller than one-third Fidelity's size may now find in-house operations financially attractive.

"Computer systems continue reductions in costs," he explained. "Savings and loans that couldn't afford their own DP systems a few years ago can now save money by going in-house.

"Unfortunately, many associations stay with service companies simply because their cost assessment is based upon outdated information," he pointed out. "It's not that

(Continued on Page 52)

A display panel on the teller terminal provides the teller with step-by-step instructions for each transaction.

In-House DP Gives Savings & Loan Flexibility

(Continued from Page 51)

managers haven't been doing their jobs, but rapid changes have made it difficult for them to keep up-to-date."

Fidelity began planning its conversion in mid-1975. In April 1976, equipment installation was completed and the association began running parallel for its savings operation.

In less then three weeks, it was able to balance to the penny and close out the old savings system. Loans were converted as of June 30, 1976, and both applications are functioning "admirably," Cothern said.

Fidelity is leasing an NCR Corp. Century 151 computer with 128K bytes of memory and four spindles of disk storage; an NCR 640 printer for producing reports and other printouts; and an accessory tape drive. Each 657 disk has a capacity of 50 million bytes.

The association purchased all other system hardware, including two NCR 796-301 CRT terminals (with printer attachments) for file maintenance and inquiry and 19 NCR 270 electronic teller terminals for its main office and branch offices. Fidelity also utilizes NCR's software package for the savings and loan industry.

This combination of equipment and software provides Fidelity with a variety of capabilities not previously available, including on-line access to account histories and the opportunity to automatically calculate penalties on certificates of deposit.

The ability to produce special statistical reports for management is another significant benefit. Automatic generation of an auditor's report, covering all "unusual" transactions, such as those requiring officer approval, is one example of enhanced security; the chance to word customer communications as it wishes is another, Cothern said.

Time-saving features of the system are important, too. Using the terminals, which have the ability to write on tape, it is possible to store off-line transactions to be input automatically.. The need to reenter data can be eliminated, reducing the chance for error. The upgraded equipment, especially the teller terminals, speeds customer service and simplifies new employee training, Cothern said.

"I'm not criticizing computer service companies," he added, "But the packages they develop for groups of savings and loan users must have inherent limitations. Consider, for example, delinquent loan notices.

"If a service company has several different associations, it can't possibly individualize the notice wording for each customer. Just changing paper in the printer would present a problem.

"'Can you imagine the uproar if the wrong notice were used and a 'get tough' message went out to the customers of an association which had a more lenient approach?"

Concern With Money

In deciding upon its system design, Fidelity was very concerned with teller terminals, upward compatibility, the availability of software and, of course, money.

"Many terminals we looked at require more powerful equipment to drive them," Cothern recalled. "We felt the NCR Century offered us the power we needed to drive the terminals at an economical cost. We can also upgrade to a more powerful century computer without having to change language or software."

"Accessories can be added for electronic funds transfer and automatic teller services without scrapping our existing terminals," he noted.

The cost of software development ruled out some systems which Fidelity considered.

Further, Cothern finds it "reassuring to know that Fidelity will have access to new software modules as they are developed." Share loans, statement savings and construction loans are examples of software needs on the horizon, he said.

Fidelity's teller terminals feature a keyboard with a CRT that provides step-by-step instructions for handling each type of transaction. The backlit instruction panel assures that no steps are overlooked — even when a teller is handling unusual transactions. New tellers do not have to memorize complicated procedures, Cothern explained.

Another feature of the terminals is their ability to record on cassettes. "If the system's down, a teller must enter the information in some way to record the transaction in the customer's passbook," Cothern said. "Since the terminal has the ability to write entries onto a tape cassette, this information can be stored off-line for convenient data reentry.

"This capability can be particularly valuable for mailroom tellers who receive, batch, prove and balance about 80% of all loan payments and a large number of savings deposits. Though they don't need to immediately enter information for a customer, they must pace their work to keep up with the volume. It's a real advantage for them to be able to store information off-line," he said.

Automatic calculation of penalties on certificates of deposit is a benefit much closer at hand. To determine the penalty on an early withdrawal from a time deposit, a manager or teller has to determine the number of days the money has been on deposit, then adjust earnings back to the passbook rate. Fidelity has been using charts in its penalty procedure.

If the money has been on deposit for two years, it takes several minutes to figure, while the customer is kept waiting. When using this feature, Fidelity will be able to calculate penalties automatically. The teller will also be able to make an inquiry and tell the customer the penalty amount before processing.

In the future, on-line history and an alpha locator, or CIF file, will give Fidelity immediate access to every account a customer has with the association, using name or account numbers.

This information is currently kept on microfiche; to use fiche, however, the teller has to leave his station or turn his back on the customer. With the information on-line, it will be easier and more convenient.

Each terminal is designed to allow operation on a different key by up to four tellers. That is an important feature in the small branch offices where secretaries, branch managers, and part-time help may relieve regular tellers during vacations, lunches and breaks, according to Cothern.

With the terminal, some transactions aren't completed without supervisor override. For example, a teller can't make a withdrawal without a passbook unless a supervisor key is used to "unlock" the terminal. Every transaction for which the key is needed automatically appears on an auditor's report.

Future requirements played a large role in Fidelity's selection of the teller terminals. The future and a trend toward a paperless society also was a key in Fidelity's decision to include a tape drive unit in its system.

"Our requirements are going to change dramatically in the coming years," he concluded. "By going in-house, we have gained the flexibility we will need."

1401 payroll blues?

The 1401 is long dead but lots of 360/370 users are still struggling with retread 1401 software.

How to spot a retread? Easy . . . a half-astute system design, 50, 60, 100 small programs, time wasting multiple read/writes, no real EEO, or ERISA capabilities . . .

If you are struggling with a retread on your 360/370, Honeywell, Burroughs or Univac, all is not lost . . . call Joe Nestor (617) 851-4111, Wang Laboratories, Inc., Lowell, MA 01851. In California, call Carl Tarascio (714) 631-0138.

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Report Eyes Contract Provisions

WINTER PARK, Fla. — A report outlining important user-oriented contractual provisions for an era of price cutting and new equipment introductions has been made available by International Computer Negotiations, Inc. (ICN).

These provisions are featured in ICN's *Computer Negotiations Report (CNReport)*, Issue 2.

In line with the latest round of hardware price cuts and new system introductions which have generated considerably interest in recent months, *CNReport*, Issue 2 deals with the numerous contractual provisions that are critical to the user in a price-cutting environment.

Four major contractual considerations are covered in the report:

- Guaranteeing the price — how to ensure that your organization will enjoy the benefit of any price reduction announced after you've signed the contract.
- Substitute or upgraded equipment — how to protect yourself (via the contract) from instant obsolescence.
- Cancellation of the order — how to get out if the price goes up or down or if new state-of-the-art equipment is announced.
- Residual guarantees — provisions to use to guarantee the future value of your system.

The report is available for $18 from International Computer Negotiations, Inc., 400 New York Ave., Box 364, Winter Park, Fla. 32790.

Card Reader Has Buffer

MELBOURNE, Fla. — Documation, Inc. has introduced a fully buffered card reader that reportedly appears as an IBM 2501 reader to IBM 360 or 370 CPUs.

The 1,000 card/min reader, the DOC 6501, is unlike the 2501 in that it is fully buffered and can be installed as a low-priority device on any position on the channel, a spokesman claimed.

The unit has a "pick and riffle" vacuum air system that the firm claims will virtually eliminate the normal card edge damage found in mechanical feed mechanisms. The unit also features data resynchronizing logic which reportedly provides accurate reading of cards with punching misregistered by more than 50% over the industry standard, the spokesman said.

The unit sells for $14,000 from the firm at P.O. Box 1240, Melbourne, Fla. 32901.

Firm Adds Two Printer Systems

MELBOURNE, Fla. — Documation, Inc. has expanded its family of line printer subsystems with the introduction of both a 1,250 line/min and a 1,500 line/min printer.

The DOC 1250 and DOC 1500 are microprocessor-controlled, fully buffered, 132-char. systems that are IBM 1403 plug-compatible.

Standard features include six-part form printing, interchangeable print bands, a forms control buffer, vertical line spacing of either 6 or 8 line/in. and a 75 in./sec slew rate, the spokesman said.

An integrated controller communicates through the interface to the host CPU, decodes all commands, controls printer hardware and reports both errors and status, the spokesman explained.

The DOC 1250 costs $45,000 and the DOC 1500 sells for $50,000 from the firm at P.O. Box 1240, Melbourne, Fla. 32901.

T/S System Drives Debut

SUNNYVALE, Calif. — Basic Timesharing, Inc. has introduced a disk drive and tape cartridge drive for its Model 4000 series interactive time-sharing systems.

The Model 4460 disk drive provides 10M bytes of nonremovable formatted storage and replaces the 7.5M-byte drive previously incorporated in the 4000/15 system, according to a spokesman.

The Model 4560 magnetic tape cartridge drive provides 10M bytes of storage using 6,400 bit/in. recording density

The drives are included as standard equipment on the 4000/15 system at no additional cost. A dual-drive version of the tape drive is included along with a disk drive in the 4000/25 system at no additional cost, the spokesman said from 870 W. Maude Ave., Sunnyvale, Calif. 94086.

SERIES 700

Easy-to-use software,
built-in printer,
large screen, more memory.

Programmable Device Records Transaction Data

PENNSAUKEN, N.J. — The Danyl Corp. here has introduced a microprocessor-controlled transaction recorder. The unit was designed for a variety of data acquisition and data logging applications, the firm said.

System 80, which features a cassette recorder and an 8080-based microprocessor controller, allows the installation of a 17-char. badge reader and 32-key calculator-style keyboard as optional input devices, according to a spokesman.

The use of the microprocessor-based controller allows the System 80 to be programmed and tailored for specific data entry and acquisition requirements.

Input data may be checked for validity and analog data may be compared to go/no-go thresholds or may be averaged over time, the spokesman explained.

All transaction information may be recorded on tape for subsequent processing and the tape capacity exceeds 125,000 bytes, he said.

The system may be purchased without firmware for user programming and Danyl will provide programming and external interfaces per user specifications. The recorder accommodates up to 1.5K bytes of read-only memory and 256 bytes of random-access memory, the spokesman said.

System 80 costs $1,250 and delivery is 60 days from the firm at N. Park Drive and Browning Road, Pennsauken, N.J. 08109.

Free Catalogs Offered

The following brochures and catalogs are available free of charge from vendors:

CW Industries, Inc. has a 12-page catalog describing the company's Cee Wee connectors for flat flexible cable with round connectors. The firm can be reached at P.O. Box 96, Warminster, Pa. 18974.

A 24-page full-color brochure covering Versatec Co.'s line of printers and plotters is available from the firm at 2805 Bowers Ave., Santa Clara, Calif. 95051.

A one-sheet catalog of capabilities describing the sonic digitizers, data converters, interfaces and accessories produced by Science Accessories Corp. is available from the firm at 970 Kings Highway West, Southport, Conn. 06490.

Literature describing the processing of payments by transaction at high speed is available from Cummins-Allison Corp., Data Systems Division, 800 Waukegan Road, Glenview, Ill. 60025.

A brochure covering Tenny Engineering, Inc.'s digital instrumentation options is offered by the firm at 1090G Springfield Road, Union, N.J. 07083.

A technical bulletin from Mavilor Motors describes the firm's line of .25-through 13-horsepower DC motors. The firm is at 285 Murphy Road, Hartford, Conn. 06114.

Breadboards

A 32-page catalog describing over 100 different breadboards for use by prototyping engineers is available from Douglas Electronics, 718 Marina Blvd., San Leandro, Calif. 94577.

A 12-page brochure that provides a graphic presentation of the metal cabinetry capability of Electronic Enclosures, Inc. is available from the firm at 225 S. Aviation Blvd., El Segundo, Calif. 90245.

A 14-page, four-color brochure by Datel Systems, Inc. describes its 40-column alphanumeric impact printer. The firm is at 1020 Turnpike St., Canton, Mass. 02021.

Network Systems Corp. is offering six application data sheets featuring Hyperchannel, a product for multiple computer interconnects. The firm is at 6820 Shingle Creek Pkwy., Brooklyn Center, Minn. 55430.

An illustrated 8-page bulletin explains in management terms the problems and solutions encountered with computer systems involving power deviation, brownouts and blackouts. It is available from Cybernex, Inc., 7171 Industrial Park Blvd., Mentor, Ohio 44060.

Introducing the Model 770 Intelligent Terminal.

From the company that makes technology affordable.

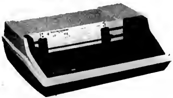
TEXAS INSTRUMENTS.

The Model 770 Intelligent Terminal is a powerful system designed to meet your distributed processing needs. Better than sending your data to your host by mail or teletypewriter, better than entering it by keypunch or key-to-disk, the 770 provides the ideal, cost-effective solution for source data entry, data pre-processing and communications for your distributed processing applications.

Reduces your communications costs.
The Model 770 removes a substantial burden from your host computer and reduces your data communications costs. By pre-processing your data on the spot, errors are reduced, and speed and accuracy are increased. Additional communications savings can result by transmitting batched data at high speed during unattended operation when line rates are lower.

Totally integrated package.
The Model 770 terminal includes all the components of an entire system. It has features like dual mini-cartridge tapes, a 1920-character video display and up to 48K bytes of memory. And it's the first video display-based intelligent terminal on the market that offers a built-in 80-column printer.

For multi-copy and 132-column capability, TI's compact, microprocessor-based Model 810 impact printer is also available.



Model 810 Impact Printer

Easy-to-use software, easy-to-learn language.
Model 770 terminals are easy to program and operate with TPL 700, the flexible, powerful Terminal Programming Language. TPL 700 is a high-level business-oriented language that greatly simplifies forms generation and procedures for data entry and local processing. Programs can be developed interactively on the 770 without ever writing lines of code.

And, of course, TI offers total service and support, including flexible maintenance plans and a nationwide network of factory-trained customer service engineers. For your distributed processing needs, TI clearly has a better solution. For more information, mail back the coupon. Or call your nearest TI sales office or Terminal Systems Marketing, (512) 258-7176.

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TEXAS INSTRUMENTS
INCORPORATED

Inforex Hikes Disk Capacity of System 5000

BURLINGTON, Mass. — Inforex, Inc. has reportedly quadrupled the disk storage capacity of its System 5000 file management system with the introduction of two dual-density disk storage units.

The Inforex offerings are the 62.1M-byte Model 5303 and the 236.1M-byte Model 5304. Up to four drives of either density can be attached to each System 5000 control unit, providing a maximum capacity of 944M bytes rather than the previous limit of 200M bytes, according to a spokesman.

The Model 5303 featues 256 byte/-sector, 59 sector/track and 5 track/cylinder. Each pack contains 823 cylinders and five platters. All five platters can be multitrack searched, he said.

The units have a rotational speed of 16.67 msec with 8.33 sec of latency; the unit achieves 3,600 rev/min, he added.

The drive supports 4,040 tracks/-pack on the initial drive and hosts up to four drives, allowing a total of 16,385 maximum usable tracks.

Extra Drives Optional

A 5303 drive with controller sells for $40,000. A controller can handle four drives and an additional drive sells for $27,000. Monthly rentals on the drive and controller range from $960- to $1,370/mo. Rentals on the additional drive range from $630 - to $830/mo.

The Model 5304 drive features 256 byte/sector, 59 sector/track and 19 track/cylinder. Each pack contains 823 cylinders and 10 platters.

Eight of the platters can be multitrack searched. Rotational speed, latency and rev/min rates are the same as those of the 5303.

The drive supports 15,562 track/pack on the initial drive and hosts up to four drives, allowing a total of 62,473 usable tracks, the spokesman said.

The 5304 with controller sells for $80,000 and a second drive sells for $42,000. Monthly rentals range from $1,835- to $2,160/mo for a single-drive unit to $940- to $1,230/mo for the second drive.

Inforex is at 21 North Ave., Burlington, Mass. 01830.

IBM Microfilmer Enhances Deposit Processing System

WHITE PLAINS, N.Y. — IBM Corp. has introduced a microfilm recorder that gives banks a sequenced tally of checks and deposit slips that have been processed by the firm's 3895 deposit processing system.

The unit records documents as they move through the 3895 reader/-inscriber, making pictures of one or both sides of each document, a spokesman explained. The unit can record more than 100,000 items daily, he said.

Eight-digit index numbers are printed on the microfilm next to document images for retrieval of specific items. The numbers match those the 3895 prints on the face of each item, permitting stored documents to be matched with the film record, the spokesman said.

Additional item-tracking capability is provided by frame marks exposed along the film edge.

The recorder, which can be field-installed, fits into a 4-ft wide section of the 3895. The accessory film cassette can store approximately 380,000 front and back images on 2,000 linear ft of microfilm, the spokesman noted.

Software Support

The on-line microfilming feature will be supported by application software, the Check Processing Control System-Deposit Processing Feature and by Deposit Processing-Operating System/Virtual Storage (OS/VS).

The monthly lease charge for the feature is $2,725; monthly use charge is 1.9 cents per 100 item passes. Purchase price is $100,000 and the price of the film cassette is $424.

First shipments will be scheduled for November 1978, the spokesman said from 1133 Westchester Ave., White Plains, N.Y. 10604.

Film Puts Stop To Data Problem

(Continued from Page 51)

trols the distance from which the information can be seen. Someone six feet away, for example, sees only a blank screen.

The screens are now in place in 440 branches, and the bank expects to have more than 900 branches on the system equipped with the light control film by 1980, Tompkins noted.

More Than a Service

Maintaining the confidentiality of customer records is more than a service, it's a basic principle of banking, he said. "Fortunately, we were able to correct a potenitally damaging situation before it went too far. Had we done nothing at the time and looked the other way, I m certain there'd be action by now in many quarters.

"The potential ramifications of doing nothing far outweigh what it has cost us," he added.

It took less than five minutes to install the sheets of film and conversion has posed no problems, except for the occasional human error, Tompkins said.

"When we started the test, one of the employees in the corporate data center indicated that nothing could be read through the new film," he recalled. "The employee said that the screens were not at all what was ordered and they didn't work.

"I told the employee to bring them over and we'd take a look at them here. They worked fine. They had been installed upside down."

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Survey Shows Users Happy With Minis

By Esther Surden
CW Staff

Most minicomputer users who responded to CW's recent survey were very pleased with their small systems despite problems with software support [CW, Aug. 29].

Those who responded were dedicated to using the small systems. For example, when asked what their firms will do when they outgrow their present mini, most users said the companies will either get a larger mini or off-load the small system with another small system. Few believed they will ever outgrow their present system.

Adding memory, disks or terminals to the present system was a growth alternative often cited. Only a few users said they would grow into a mainframe when their processing needs become too complex for their present mini.

Outgrowing the system "is not forseeable at the present time," one user told CW, while another said "it cannot happen."

Upgrade Capability

System upgradability was a topic touched upon often by users explaining why they switched from one system to another or why they liked their particular mini.

One company that was happy with its Hewlett-Packard 2100 system converted to a Prime Computer, Inc. 400 minicomputer. "The reason we did not stay with HP is that it is not easy to upgrade in small steps. With Prime, we can gradually upgrade as (and how) we need it with no software modifications," the DP manager said.

Another user, explaining why his company will get another supermini if it ever outgrows the one it owns, said: "Two superminis are better than one large mainframe. Also [this] helps cash flow [because] you buy it when/as you become ready."

The price/performance benefits of minis were touted by many users. "Transaction-oriented minis are great. They give users control of their systems and the price/performance is outstanding," in the opinion of one systems manager.

A Los Angeles company using Digital Equipment Corp., Qantel Corp., Data General Corp. and IBM minis said, "generally, price/performance ratio and type of applications are superior for minis."

Minis bring processing power closer to the user, several respondees pointed out. "The trend toward minis will continue as large systems remain unmanageably complex," a user of a mainframe who also copes with 50 minis predicted. "Using a mini allows local users access to data and fast turnaround," a DP manager said.

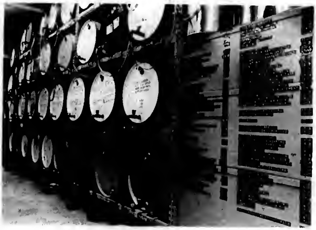
System Sniffs Out Savings

By Esther Surden
CW Staff

NEW YORK — "Our inventory made up our largest investment, so we thought we'd better go after our bread and butter application first," William Bulger, treasurer of Fritzsche, Dodge and Olcott, Inc., said.

The firm's system has been credited with cutting response to inventory inquiries from three days to 10 seconds and reducing the disparity between physical inventory and recorded inventory from 7% to 1%.

The firm is using an IBM 3/15 small business system to keep track of more than 4,000 off-the-shelf products, 3,000 special orders and more than 180,000 formulas for the flavors, fragrances and oils it produces.


Inventory system at Fritzsche Dodge and Olcott, Inc. copes with materials for 180,000 flavor and fragrance formulas.

Prior to the company's first move to a computer, an IBM 1401, the inventory was kept on receiving and withdrawal slips for each product and each lot of the product. The slips were kept in a file cabinet clipped to "long skinny plates." When a withdrawal was made from a particular product supply and lot, a withdrawal slip was added to the file and the balance left was forwarded, Bulger said.

Files Unwieldly

The business grew to the point where the file cabinet became a cumbersome way to do business. In addition, "the company's needs were getting more sophisticated" and government regulations more complicated.

"If the Federal Drug Administration, for example, banned certain chemicals, we would have to find which products in the line used those chemicals in order to revise the formulas" or else withdraw the product, he continued.

The 1401 performed the inventory application using cards "but it was still too slow." Teletypes at the company's remote locations in New Jersey transmitted inventory data daily, so the records at company headquarters were only behind by a day and a half, rather than three days.

Anticipating a move to an on-line system, the firm then installed an IBM 360 which emulated the 1401, because it was "easier to go from a 360 to a 3," Bulger said. This allowed the company to keep in business while the programs were being changed to on-line status.

The present IBM 3/15 is attached to six remote terminals in the firm's manufacturing facilities. The terminals are directly on-line to the 3/15 and data is entered at the remote locations. The firm recently installed two additional terminals for inventory and stock maintenance.

"When we used to take physical inventory we were happy with a 7% or less disparity between our figures and inventory. With this system, there is less than a 1% difference," he said.

Using Effectiveness Grid — Part 1

Method Aids Firms Nearing DDP

By Carl Masi
Special to CW

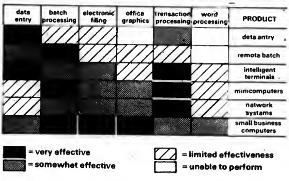
We recommend that users evaluate their needs in selecting small systems for distributed processing based upon an analysis of what we call an effectiveness grid. In fact, the larger and more diversified the company, the more important this effectiveness grid becomes.

The purpose of the grid is straightforward. It is designed to help a user measure the utility (of a product) to his organizatin vs. the commitments and risks it faces (by choosing a particular piece of equipment).

This is the first part of a two-part series on using an effectiveness grid to determine distributed systems requirements. The second part will cover organizational enrichment, policy impact and measuring productivity of such a system.

There are six relevant issues not usually considered by users in their development of dispersed information systems.

First, we have the issue of functional range: the extent to which a single product or product type can fulfill all of the most commonly needed functions in the departments, offices and other locations that the user might wish to incorporate in a distributed network.



data entry	batch processing	electronic filing	office graphics	transaction processing	word processing	PRODUCT
■	▨	▨	□	▒	□	data entry
■	■	▨	▨	▨	□	remote batch
■	▒	▒	▨	■	▨	intelligent terminals
▨	■	▒	▒	■	▨	minicomputers
▨	▒	▒	▒	■	▨	network systems
▒	■	■	■	▒	▒	small business computers

■ = very effective
▒ = somewhet effective
▨ = limited effectiveness
□ = uneble to perform

An example of a functional range effectiveness grid.

Essentially, data entry, electronic filing, transaction processing, batch processing, office graphics and word processing are all of the functions that one is likely to have occasion to perform in a distributed network, now or in the future.

The available classes of products with which to perform those functions are data entry systems, remote batch terminals, intelligent terminals, minicomputers, networked systems and small business computers.

Any or all of these products can be clustered or stand-alone, on-line or off-line, or available in any one of a number of configurations. What is important to measure is the extent to which each class can perform the maximum number of planned and anticipated functions in the network, not through massive customized development, which is costly to initiate and even more costly to maintain, but as standard off-the-shelf product capability.

The second major issue to be

(Continued on Page 58)

Industrial Process Controller

SANTA CLARA, Calif. — Selanar Corp.'s MC-1 process controller is designed to handle large industrial control and data acquisition projects, the firm said.

The MC-1 was designed to operate in a variety of industrial applications including industrial equipment monitoring, power demand regulation, chemical and petroleum process control and scientific experimentation control.

The UCP operating system aids engineering firms and end users who cannot afford to develop extensive software capabilities, the vendor claimed.

A user enters simple statements and the compiler composes the control programs using appropriate translation for each statement, the firm explained.

The MC-1 controller consists of a 16K-word CPU, 1,920-char. CRT terminal, 30 char./sec matrix printer, IBM-compatible diskette storage system and a 64-channel analog measurement device.

A custom digital I/O interface includes 256 inputs and 128 outputs with a basic scan rate of 10 times per second per channel under program control. The interface also has two serial I/O ports for the CRT and printer. An 8-bit parallel interface is also part of the package.

The package costs $26,000 including on-site setup and test plus software instruction. Selanar is located at 3054 Lawrence Expressway, Santa Clara, Calif. 95051.

Video Unit Fits DG Minis

BURLINGTON, Mass. — The Model 200-D Graphics and Imaging Video Processor from Lexidata Corp. generates raster-scanned, refresh, graphics and imaging displays, according to the firm.

The unit is contained on a 15 in. by 15 in. printed circuit board and fits into "any standard Data General Corp. Nova or Eclipse," the firm noted.

A standard upper case Ascii alphanumeric character generator produces 5 by 7 dot matrix characters which may be superimposed on the image displayed.

Featuring a writable control store, the Model 200-D allows modification of all image-processing and data-formatting routines under program control from the host system, the company said.

Model 200-D costs $4,900 for a basic black and white model and $5,300 for the basic color version, Lexidata said from 215 Middlesex Tnpk., Burlington, Mass, 01830.

Grid Aids DDP Selection

(Continued from Page 57)

faced in terms of distributed processing is transitional ease — the ease with which the user can take the current system and planned new products and integrate them into the dynamics and geography of the business. This integration must be accomplished in six ways — selecting and preparing sites, training the staff, converting and developing software, insuring compatibility with existing systems if needed, implementing procedural changes and ensuring adaptability to both initial and longer term requirements of the business.

Using the grid it becomes clear that some products are much easier to install painlessly than others. Some will require substantial software development and conversion. Others, by their nature, have limited future growth potential. And some will require heavy training commitments.

To many users, one or more of these limitations may be unimportant, since they are planning major changes for which training or conversion efforts should be heavy. But the point of this grid evaluation is to anticipate and clarify in advance and with precision the extent of such requirements.

The third major issue in distributed processing development is the configurability of the various product classes, both now and in the future. If the organization is changing constantly, the requirement for equipment to keep up with that change is of paramount importance.

System Expandability

Therefore, when we talk of configurability, we are talking about the ease with which product classes can be reshaped, when and as needed from single stand-alone devices to small, medium or large clusters; or expanded to become multiprocessing systems, if such is required; or through minor software modification made to perform in concurrent or multiprogramming modes.

Another key aspect of configuring a network of small systems is mobility, the ease with which Product A, no longer needed in Location B, can be packed up and moved to Site C.

Peripherals Important

So also is the peripheral equipment complement important. The 15 char./sec printer in use today at a specific site will probably have to grow to 45 char./sec or 60 line/min before long. It may have to have some disk storage as well. Thus it is very important to rate product classes on their effectiveness in terms of configurability.

This article was excerpted from a speech delivered by Masi, director of product marketing for Wang Laboratories, Inc., Lowell, Mass., at a recent conference.

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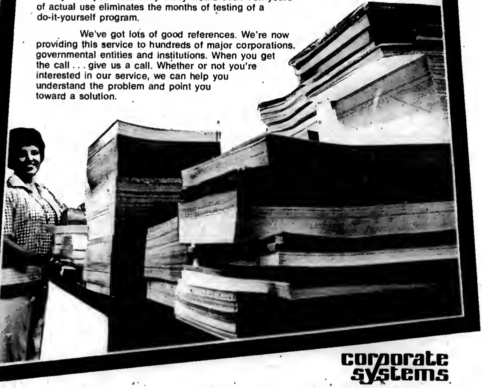

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Dual Minis Offer Process Control

PRINCETON, N.J. — A minicomputer-based process control system that uses dual Modular Computer Systems, Inc. 32-bit CPUs is available from Metromation, Inc.

The system was designed to "meet information and control requirements for large refineries, gas pipeline systems and petrochemical plant complexes," Metromation said. Typical applications include data gathering, monitoring of utility services and control of unit operations, it added.

The CPUs share data loads by "functional splitting" rather than having a redundant CPU on stand-by, a spokeswoman explained. The first CPU handles real-time functions while the second handles interactive/batch operations.

Either CPU can take over the operations by dual addressing of key peripherals, redundant data recording techniques and inter-CPU communications techniques, the firm noted.

Prices for the system range from $500,000 to $2 million and are dependent on the individual user's requirements, the spokeswoman stated. The company can be reached at 1100 State Road, Princeton, N.J. 08540.

Memory Replaces DEC Disk

ENGLEWOOD, Colo. — A solid-state replacement memory unit for the Digital Equipment Corp. RF/RS-11 fixed-head disk is available from Monolithic Systems Corp.

Dubbed the Extended Memory Unit, (EMU), the device features an access time of 2.1 microsec, required to set up control registers and initiate the transfer of information to and from the main memory, Monolithic said.

The unit can be used in DEC PDP-11/04 to 11/70 systems.

Using interchangeable memory modules, the unit features a dual-port Unibus interface, the vendor said.

The EMU costs $23,795 for one million bytes. Monolithic is located at 14 Inverness Drive East, Englewood, Colo. 80110.

Micro Debuts

LA JOLLA, Calif. — The Micro-740 from Micro Business Applications, Inc. is a small business system based on a microcomputer.

The basic system, configured around an Intel 8020 microprocessor, includes 58K bytes of user-accessible memory; one CRT; a 6M-byte fixed platter disk drive; cartridge tape drive capable of handling 2.4M- to 11.2M bytes of data depending on how it is formatted; a 125 line/min printer.

The basic system, available next month, will cost $24,750. The Fortran compiler will cost $1,000. The company can be reached through P.O. Box 2888, La Jolla, Calif. 92038.

Controller Fits Nova, DCC-116

PALISADES PARK, N.J. — A peripheral controller for Data General Corp. Nova 1200 and Digital Computer Controls, Inc. DCC-116 minicomputers that reportedly can replace up to five DG controller boards is available from Computer Data Access, Inc. (CDA).

The Model 6100 controller provides all controllers needed for a small on-line, multiterminal computer system. It can handle up to four California Computer Products, Inc. 140 series floppy disk drives, up to three RS-232 devices and a line printer, the firm noted.

The unit costs $2,200 with quantity discounts available, a spokesman noted from CDA at 470 Commercial Ave., Palisades Park, N.J. 07650.

IDS Introduces Impact Printer

WATERTOWN, Mass. — A tabletop dot matrix impact printer designed for use with minicomputers and microcomputers is available from Integral Data Systems, Inc. (IDS).

The printer operates at up to 120 char./sec and accommodates up to 132 char./line, IDS said. An RS-232 and current-loop serial interface are standard.

Other features include enhanced mode double-width characters, selectable character and line sizes and multiple copy capability on both fanfold and roll paper.

A 5 by 7 dot matrix is used to print the standard 64-character Ascii set, the company noted.

The unit costs $745 from IDS at 5 Bridge St., Watertown, Mass. 02172.

3M Offers Cartridge For HP 7905 Drive

ST. PAUL, Minn. — A front-loading, single-disk cartridge for the Hewlett-Packard Co. 7905 disk cartridge drive is available from 3M Co.

The Scotch Brand 932 disk cartridge features a 200 track/in. track density and a bit density of 4,400 bit/in. It has a capacity of 10M bytes per cartridge, the firm noted.

The disk costs $150 to $160, depending on quantity, from 3M at Department DR7-6, 3M Center, St. Paul, Minn. 55133.

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Digital Associates Corporation

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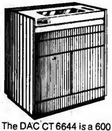

The DAC CT 6644 is a 600 LPM chain-trein printer that replaces LP11-YA.
It gives letter-quality printing, and costs about 40% less than DEC's 600 LPM drum printer.
Again it comes with PDP-11 interface, installation and maintenance.

Specification:
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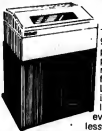

The DAC 2290 900 LPM printer is a plug-to-plug replacement for the LP11-CA. But it costs 30% less. In fact, it even costs 25% less then DEC's 600 LPM printer. Comes with PDP-11 interface, installation end maintenence.

Specification:
Solid-font drum printer
900 LPM, 136 column/line
64 charecter/column

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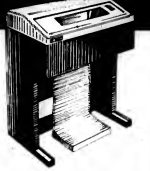

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PDP-11 Changes Eased

WOODLAND HILLS, Calif. — A device designed to let Digital Equipment Corp. PDP-11 minicomputer users physically and electrically reconfigure their systems is available from Datafusion Corp.

Called the OSR11-A Busrouter, the unit can aid users who, for example, have "too many peripherals for a single CPU, causing the Unibus to be overloaded," a spokesman explained.

The Busrouter can have up to eight switching planes in its housing, the company said. The Unibus plugs into one of the switching planes and comes out as two cables on the other side of the box, a spokesman explained.

Two different sets of peripherals can then be attached to the cables. A user could run for four hours with one set, for example, and then switch to the other set for the rest of the processing.

A number of different configurations can be accommodated involving multiple CPUs, the spokesman added.

A single-plane version of the product costs $995. The systems are delivered configured to the user's particular application with delivery available in "about three weeks," the spokesman continued. Datafusion Corp. is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Mini Controls Library Circulation

CINCINNATI — A minicomputer-based book circulation and control system is available from Cincinnati Electronics Corp. here.

Called Classic for Circulation Library Automated System for Inventory Control, the system can be supplied as a complete turnkey unit, a spokesman noted.

The system operates without the need for a trained computer operator, the company stated.

Hardware for the unit includes the CPU, a Univac V77 (formerly from Varian Data Systems) with a minimum of 64K of memory. Also included are a printer ranging in speed from 180 char./sec to 1,200 line/min, a single magnetic tape unit for backup and one disk or multiple disks with up to 600M bytes of storage.

Terminals include a JRL-1000 circulation terminal with a built-in bar code reader and a 45 char./sec receive-only printer.

Supplied with all peripherals, terminals and software, the system ranges in price from $100,000 to $300,000 depending on the library. The system is multiprogrammable so users can run other applications on it, a spokesman noted from the company at 2630 Glendale Milford Road, Cincinnati, Ohio 45241.

Decitek Adds Reader

WORCESTER, Mass. — A paper tape reader that can be configured for desktop or rack mounting with or without fanfold bins is available from Decitek.

The Model 262D9 reads at up to 300 char./sec bidirectionally and synchronously or asynchronously, according to the vendor. Standard features include an RS-232C connection, current loop and parallel I/O interfacing. Transmission rates for the unit are selectable up to 9,600 bit/sec.

Interface characteristics are also selectable by a switch mounted on the rear panel. Additional program functions are internally programmable by jumpers, the company noted.

The unit costs $675. Decitek is located at 250 Chandler St., Worcester, Mass. 01602.

COM Recorder Handles Color

MINNEAPOLIS — A computer output microfilm (COM) graphics-recorder that operates with Digital Equipment Corp.'s PDP-11 family running under RT-11 or RSX-11 is available from Dicomed Corp.

The system was designed to satisfy both black and white and color scientific and business graphics needs, the firm said. It is available in either on-line or off-line system configurations and produces black and white and color vector or raster images on 16mm, 35mm, 70mm and 105mm film

A software package provides for job and recorder control, software character generation, color control and microfiche camera control.

The base price of the D48 is $99,750. Ten optical assemblies ranging from $3,750 to $24,750 are also available.

Off-line systems begin at about $200,000, a spokesman said from the company at 9700 Newton Ave. South, Minneapolis, Minn. 55431.

Stein Has Array Processor

WALTHAM, Mass. — Stein Associates, Inc. has introduced an array processor designed for use as a number cruncher along with minicomputers.

The AR-10 has a multiprocessor design. Subprocessors operate in parallel and are interconnected by the system's bus, which performs direct memory access transfers without cycle stealing.

The unit also features a cross-assembler and linker written in Ansi Fortran, he said.

The unit has an AR/Scan panel that allows operational analysis and program debugging by trapping and displaying data, addresses or other program parameters in any of the subprocessors while the program operates at full speed, the company added.

A single subprocessor configuration costs $28,000 and a three-processor configuration costs $100,000. Stein is at 280 Bear Hill Road, Waltham, Mass. 02154.

Olivetti A-6, A-7 Get Floppy Disk

NEW YORK — Olivetti has enhanced its A-6 and A-7 small business systems with the addition of floppy disk subsystem.

The subsystem, which can also be used with the firm's TC800 terminal, is said to be compatible with IBM 3740 floppy disks.

The floppy unit is made up of an automatic loader, dual read/write floppy disk unit and a power supply.

The unit costs $4,560 from Olivetti at 500 Park Ave., New York, N.Y. 10022.

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'Typical' One a Professional

Hald: Hobbyists Come in Three Varieties

By Frank Vaughan
CW Staff

ATLANTIC CITY, N.J. — Much attention has been given to the hobbyist use, but little has been done to find out exactly who that user is. The hobbyist user can actually be divided into three categories, according to Alan P. Hald.

Hald is in a good position to know about hobbyist users because he is a co-owner of the Phoenix Group, Inc. The Phoenix Group owns the Byte Shops of Arizona, Byte Shop mail order organization and Micro Age, which specializes in wholesale and special retail sales.

The first category is the pure hobbyist, according to Hald. This person wants to build the microcomputer from the bare boards up.

The second and commonest type of hobbyist is interested in a kit-type system that requires a fair degree of time and effort, but has much of the complex assembly already done.

The third category is the casual hobbyist who is interested in either a kit or assembled mainframe and is willing to purchase assembled memory, CRTs and other peripherals.

The typical hobbyist — if there is such a creature — is usually a professional in a field that is oriented toward technology, according to Hald. Another way to describe this person would be as a "forward-looking professional," he said.

It is not uncommon for this person to have a goal of eventually integrating hobby and profession, he noted.

This integration of hobby and profession can come when a person is, for example, a writer who uses a system for text editing or a businessman who uses a system for computational tasks. Hald knows one architect who uses his hobby system for doing his contract bidding.

People want to get involved with microcomputing as a hobby, he said, but they also are looking for some long-range applications, like the retired person he knows who is working to develop a system to help the blind interact with a CPU.

The hobbyist is generally buying an integrated system consisting of a microprocessor unit (MPU) with about 8K bytes of memory, Hald said, but it is not unusual to find some systems with a standard of 16K to 24K bytes of memory. The systems are initially tape-oriented, but now people are getting floppy disk systems.

This increase in the number of floppy disk systems is driving the average investment in a microcomputing system up from the $1,500 to $3,000 range to the $4,000 to $6,000 range. The higher investments are not uncommon, especially since the price of CRTs is coming down and they are easily within the reach of the hobbyist.

Most of the hobbyists are still involved with 8-bit machines, Hald said. The 8080 is still king, but the Z80 is "hot on its tail."

Some 16-bit machines are emerging as the systems for small businesses that require greater capabilities, such as some form of mass storage and access to established software.

Each of the different categories of hobbyists is approaching the problem of system cost in a different manner, Hald noted. Prices are a main concern for the pure hobbyist, who is able to keep costs to bare bottom by building most or all of the system, often just for the joy of builidng.

The hobbyist who would like to build a kit doesn't consider cost a critical factor. The purchase of a system for this user doesn't have to be cost-justified because it is purely for personal use.

The casual hobbyist, on the other hand, is often interested in a micro only if it can do a certain job and if it is somehow cost-justified.

All three types of hobbyists are going to be quite dependent upon the retail store, which will fall in two categories, he said.

The systems store will be the main place for the hobbyist, he predicted, noting that the user will be able to find everything from the smallest micro up to small minicomputers.

Turnkey Based on 8080

PALO ALTO, Calif. — Promedics Data Corp. has introduced a turnkey microcomputer system for accounting applications in medical offices that incorporate a hobby microcomputer and standard peripherals.

The PAC 1 is an 8080-based system that uses the S-100 bus design and incoporates dual Shugart Associates floppy disk drives, a Digital Equipment Corp. LA-36 hard-copy printer and a Perkin-Elmer Fox CRT. The turnkey system uses Promedics applications software.

The system allows a doctor or small clinic to establish uniform accounting procedures for patient ledgers and gives random access to patient information seconds after the account is keyed in, according to a spokesman. A special report generator allows each end user to configure individual reports using any information stored in the patient data base, he added.

The current PAC 1 uses two 16K dynamic memory boards, a dual serial I/O board and either a Z80 or 8080 MPU card. An additional disk interface card is also housed in the system, he said.

Complementing the hardware is a disk operating system and language compiler/interpreter that generates pseudo operating code which can be run independently from the source code.

The disk operating system takes up approximately 20K bytes of memory, leaving 12K for application and data, the spokesman noted. Larger programs can be implemented by either adding more memory or using the operating system's overlay capabilities, he claimed.

Found Reliable

Promedics has found the hobby-type computer mainframe to be reliable and cost-effective when built and tested to commercial standards, he said. The firm is committed to microcomputers and believes "hobby computers are here to stay if they can be used for practical DP applications and achieve a price/performance ratio lower than their competition," he stated.

A PAC 1 system costs $13,500, which includes operator training and support for one year. Promedics is at Suite 210A, 560 San Antonio Road, Palo Alto, Calif. 94306.

Line Tamers Regulate Voltages

ADDISON, Ill. — Shape Magnetronics, Inc. has expanded its line of constant voltage transformers by adding the LT-2 series of Line Tamers.

The LT-2 series units have low harmonic content and can be used to prevent memory loss and operating errors caused by line noise, spikes and transients, the firm claimed.

The series will produce regulated output voltages of 120Vac or 120- and 240Vac. Output will vary less than 3V RMS from nominal for total input variations up to 35V RMS for the 120V transformers, Shape said.

Volt-ampere ratings of the transformers range from 500VA to 7,500VA, and all transformers rated at 2,000VA and below are provided with output recepticles, an on/off switch, line cord and indicator light.

The units are designed for 60Hz operation.

Prices range from $212.50 to $1,335, a spokeswoman said from 815 Kay St., Addison, Ill. 60101.

Controller Gets Basic I/O Driver

VAN NUYS, Calif. — Roche Systems has enhanced its multicassette controller with an I/O driver for Basic, the firm said. Basic programs can now read records from cassette tape and write records to cassette tape under program control, a spokesman explained.

The I/O driver is accessed from Basic and handles all I/O to either the cassette operating system or to the console. The cassette operating system opens and closes files.

When a logical record is written, the blanks are compressed out and the record is stored in a buffer. When the buffer is filled, the physical record is written into the cassette, the spokesman said.

Each read from the cassette brings 256 bytes into the input buffer. Blanks are added back into the logical records and they are passed on to the program for processing one record at a time, he noted.

The multicassette controller, which plugs into an interface board, comes in two models, a 4-port kit that costs $140 and a 2-port kit priced at $110.

Software included consists of the cassette operating system, Basic I/O driver and listing, assembler with patches to assemble large programs from tape, demo Basic program and demo record file.

Optional application software is available for such functions as text editing, formatting, sorting and merging, the spokesman said from the vendor at 7101 Mammoth Ave., Van Nuys, Calif. 91405.

8080 Can Use PDP-8 Software

SAG HARBOR, N.Y. — The Amide Corp. here has introduced a simulator that allows 8080 users to utilize Digital Equipment Corp. PDP-8 programs.

The software is available in two formats, Intel paper tape and Intel Tarbell cassette, according to a spokesman. It comes with a user's manual, PDP-8 programming tutorial, PDP-8 loader, Decus library information and a source listing of the I/O routines.

The paper tape version costs $20 and the Tarbell cassette costs $23 from the firm at P.O. Box 600, Sag Harbor, N.Y. 11963.

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Mijobe Offers Altair Power

UPLAND, Calif. — A custom power supply kit for the direct replacement and upgrading of the power supply provided with the Mits, Inc. Altair 8800 microcomputer is available from the Mijobe Corp.

The Mijobe kit 10-1026K reportedly enables the user to operate a full complement of plug-in boards with a safety margin of power.

The design incorporation of grounded electrostatic shielding between the primary and secondary windings of the kit's transformer virtually eliminates the propagation of external electrical noise into the microcomputer itself, the firm claimed.

The unit operates from 110- to 130 Vac, 60Hz, single-phase power and provides outputs of 16 Vdc +2A and one output of 8Vdc at 20A with forced air cooling.

The unit costs under $60 from Mijobe at 657 N. Benson, Upland, Calif. 91786.

Compiler Basic Comes on Tape

CERRITOS, Calif. — Software Dynamics has a compiler version of Basic for 6800-based microprocessor systems.

The Basic permits decimal arithmetic, formatted output, file I/O and multiple statements per line.

The Basic compiler costs $150 and comes in a cassette tape formatted for the "Kansas City" standard. Software Dynamics is at 17914 S. Laurelbrook Place, Cerritos, Calif. 90701.

Drives, S-100 Linked

CULVER CITY, Calif. — Info 2000 here has an adapter to interface Persci, Inc. diskette drives to S-100 bus microcomputers, according to the firm.

The adapter costs $120 in kit form and $195 fully assembled and tested.

An additional 1K byte of random-access memory costs $40 and 3K bytes of optional erasable programmable read-only memory costs $120 from Info 2000 at P.O. Box 3196, Culver City, Calif. 90230.

Wintek Has Interface

LAFAYETTE, Ind. — Wintek Corp. has a cassette interface that operates at speeds up to 2,400 char./sec.

The interface supports the "Kansas City" standard.

The interface sells for $139 from the firm at 902 N. 9th St., Lafayette, Ind. 47904.

Chess Out in Basic

COCKEYSVILLE, Md. — Chess, in standard Basic, is available from Tenberg Software Systems here.

The program takes 16K bytes of memory, a spokesman noted.

The program, on paper tape with documentation, costs $20 from the firm at 10311-J Malcolm Circle, Cockeysville, Md. 21030.

MICROCOMPUTING CLASSIFIED EXCHANGE

This special classified section in solid (non-display) format is designed for people who are working with or interested in microcomputing. Through it, you can buy, sell or swap equipment software or services; contact people with simliar interests; start clubs; disseminate information; look for game partners; or send messages to other individuals. As the number of ads increases, this section becomes more useful; so we've tried to make ad placement as simple and inexpensive as possible. Details are as follows:

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Hobby Havens

As a service to hobbyist readers, Computerworld periodically will list the micro clubs in different parts of the country.

Clubs wishing to be included in this listing should send their name and address as well as the name and address or telephone number of a contact person to Frank Vaughan at Computerworld, 797 Washington St., Newton, Mass. 02160.

ARIZONA

The Arizona Computer Society. The society can be reached at P.O. Box 744, Goodyear, Ariz. 85338.

DELAWARE

Delaware Users of Microprocessor Systems (Dumps). Contact: David Corbishley, 12 Keith St. Kimberton, Newark, Del. 19713. Telephone (302) 737-3367; in New Jersey, telephone (609) 921-3260.

ILLINOIS

The Peoria Area Computer Club (Pacc). Contact: Anthony M. Drake, 2019 N. Idaho, Peoria, Ill. 61604. Telephone (309) 682-5894.

LOUISIANA

Northwest Louisiana Computer Group. Contact: Michael Murray, P.O. Box 8843, Shreveport, La. 71108. Telephone (318) 635-4643.

Debach Computer Club. The society is at Rt. 3, Box 110, Dubach, La. 71235.

Crescent City Computer Club. Contact: Emile Alline, 1119 Pennsylvania, Slidell, La. 70458.

NEW MEXICO

Albuquerque Computer Club. Contact: Gary Tack, P.O. Box 866, Corrales, N.M. 87048.

OHIO

Southeast Ohio Computer Society. Contact: Dennis Anderson, P.O. Box 67, Cambridge, Ohio 43725.

OKLAHOMA

Central Oklahoma Computer Association. Contact: Lee Lilly, P.O. Box 2213, Norman, Okla. 73070.

Oklahoma City Computer Club. Contact: Bill Cowden, 2412 S.W. 45th, Oklahoma City, Okla. 73119.

TEXAS

Texas A&M University Microcomputer Club. The society can be reached at P.O. Box M-9, College Station, Texas 77844.

Texas Computer Club. Contact: L.G. Walker, Rt. 1, Box 272, Aledo, Texas 76008.

Panhandle Computer Society. Contact: Tex Everett, 2923 Spring, Amarillo, Texas 79103.

Central Texas Computer Society. Contact: Ray D. McCoy, P.O. Box 17303, Austin, Texas 78760.

Microputer Tinkers & Bug Busters. Contact: William Peters, 3845 Le Bleu, Beaumont, Texas 77707.

Lamar University Computer Club. Contact: Tim Magnuson, L.U. Box 10996, Beaumont, Texas 77710.

El Paso Computer Group. Contact: Jack O. Coates Jr., 213 Argonaut No. 27, El Paso, Texas 79912.

Computer Hobby Group of North Texas. Contact: Bill Fuller, 2377 Dalworth, No. 157, Grand Prairie, Texas 75050.

Houston Amateur Microcomputer Club. Contact: Cliff Carley, 4506 Woodside, Houston, Texas 77023.

South Texas Computer Club. Contact: Ray Atnip, Suite 125, 11246 S. Post Oak, Houston, Texas 77035.

Permian Basin Computer Group. Contact: John Rabenaldt, P.O. Box 3912, Odessa, Texas 79760.

Northside Computer Group. Contact: Jim Aldridge, 2318 Townbreeze, San Antonio, Texas 78238.

San Antonio Computer Group. The society is located at 7517 Jonquill, San Antonio, Texas 78233.

Nasa-JSC Computer Hobby Group. Contact: Marlowe Cassetti, 1011 Davenport, Seabrook, Texas 77586.

RAM 'Semikit'

EMERYVILLE, Calif. — A 16K-byte random-access memory (RAM) board in semikit form has been introduced by Processor Technology Corp.

The RAM board is, despite the "semikit" name, fully assembled and wave-soldered with pretested integrated circuits.

Board capabilities include independently addressable 4K-byte blocks, 5 watt power consumption, invisible refresh and 400 nsec worst-case access time, he claimed.

The board also has built-in backup power connections, he noted.

The board costs $369 in semikit form and $399 fully tested and burned in form from the firm at 6200 Hollis St., Emeryville, Calif. 98608.

Heath Course To Teach Basic

BENTON HARBOR, Mich. — Heath Co. introduced a self-instruction course in Basic language programming techniques.

The course was designed "to teach even those with little or no computer experience the skills necessary to intelligently converse, create and program in Basic," a spokesman said.

Programmed instruction tests combined with demonstration programs and practice problems are employed in the course to teach Basic formats, commands, statements and procedures.

The course is keyed to the Heath computer systems; however, because of the universal machine-independent nature of Basic, it can be a supplement to any other computer systems using Basic, the spokesman noted.

The course, EC-1100, costs $29.95 from Heath at Dept. 350-450, Benton Harbor, Mich. 49022.

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Interim Relief Viewed IBM Trial Option

By Molly Upton
CW Staff

What are the alternatives to a trial — U.S. vs. IBM — that seems like it will last forever?

Justice could ask for interim relief which, if granted, could tie IBM's hands in specified areas. A likely time for such a motion would be at the completion of the government's case, observers recently indicated.

There could be a settlement, but sources generally discount that possibility for the present. One industry analyst, however, said the Greyhound decision [CW, Aug. 29] has increased the possibility of settlements in other cases pending against IBM.

One consultant believes the current antitrust case is a smokescreen for IBM. Although the general public thinks it would be unreasonable of IBM to violate the antitrust laws while the current case is being prosecuted, IBM in fact has received a monopoly license during the "interregnum" since the case was filed about eight years ago, he said.

During this time, IBM has put through a revolution, he said.

All the issues in the government case are academic, the consultant remarked. In effect, the government should abandon this suit and draw up a new complaint based on current IBM actions, he said.

Justice conceivably could ask for interim relief to prevent a continuation of this "interregnum," he said.

If the Department of Justice asks for interim relief, Computer & Communications Industry Association (CCIA) president A.G.W. (Jack) Biddle thinks Judge David N. Edelstein might well consider the motion favorably, especially in view of the fact that IBM has refused for the last 18 months to stipulate the record.

Without a stipulated record, the trial would go back to square one if Edelstein had to step down from his post, Biddle said.

And if Edelstein granted some form of interim relief, there are good reasons why IBM might not want to appeal it, he continued.

For instance, if the Second Circuit Court of Appeals and/or the Supreme Court denied the appeal, thus concurring with Edelstein, IBM's whole delaying tactic would be "blown sky high," Biddle said.

The Department of Justice, in a motion for interim relief, could seek injunctions forcing IBM to disclose its installed base on a regular basis, disclose to the industry any new de facto standards at the same time as they are introduced internally and forcing it to engage in total unbundling, Biddle suggested.

On the other hand, another possibility is that Edelstein could deny both a motion for interim relief from Justice and IBM's motion for summary judgment, Biddle speculated.

"In my opinion, based on the record, Edelstein will probably deny a motion of summary judgment by IBM because the evidence is overwhelming," Biddle said.

Long Time Coming

Jim Peacock, editor of *EDP Industry Report*, a newsletter from International Data Corp., observed that if the trial continues as scheduled, the decision probably would not be forthcoming until the early 1980s — and then it will be essentially academic unless Justice keeps bringing in new issues, he said.

Thus there is the possibility Edelstein could invoke an interim relief after the government presents its case, he added.

The powers of interim relief can be very broad, Peacock said, observing one judge used them to tell a firm to fire its president.

However, Cal Crary, litigation analyst for Bache, Halsey, Stuart and Shields, sees no possibility of any motion for interim relief in the near future.

(Continued on Page 67)

Two Pico Directors File Charges Against Firm's Chairman Potter

By Toni Wiseman
CW Staff

PLAINVIEW, N.Y. — Two directors of Potter Instrument Co. (Pico) have filed a series of applications and complaints charging company founder and chairman John T. Potter Sr. with misappropriation of company assets, failure to perform duties and harassment.

The actions were filed in the U.S. District Court for the Eastern District of New York here by Samuel A. Alexander, vice-president, and David Porter, secretary, both of whom Potter is seeking to oust as Pico directors.

Counsel for Potter called the claims "inaccurate and distorted," adding only that "Mr. Potter's response to all actions will be contained in his answer which will be filed soon."

In response to the directors' applications, Bankruptcy Judge William J. Rudin signed an order requiring Potter to show cause by Sept. 12 why Pico should continue to pay him "any further remuneration or compensation."

The first action filed by Alexander and Porter asks for the return of two 1971 Cadillac Eldorados which Pico has been maintaining at "a cost in excess of $1,000 per year per automobile" and of a 20-foot catamaran sailboat. All three items are alleged property of Pico.

In their application to cut off any further payments to Potter, the directors charged:

- "Potter is not now performing any work or services for Pico and only rarely is he at Pico's offices."
- "He has advised key Pico personnel that he will ruin Pico if he does not regain personal control of Pico."
- "Potter has deliverately attempted to subvert management policies and orders."
- "Potter has solicited and used Pico employees on company time for personal services unrelated to Pico business."
- "Potter has ordered Pico employees to cease work on projects to which they have been assigned and to work on other projects which interest Mr. Potter personally."
- "He has created extreme disruption, confusion and turmoil among Pico employees by making excessive and unwarranted demands for papers, documents and information, by promoting the so-called 'merits' of his lawsuit against . . . Alexander and Porter . . . and by threatening employees with the loss of their jobs if they did not assist him in his attempts to oust . . . Alexander and Porter."

A third action charges Potter "unlawfully received and collected from Pico a sum of not less than $1,113,629.37 belonging to Pico, willfully, maliciously, wrongfully and unlawfully converted the same to his own use." The action asks for repayment of the sum with interest.

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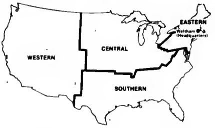

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CIRCULATION DEPARTMENT

What Might Have Been

By Molly Upton
CW Staff

NEW YORK — IBM's Input/Output Division was ready, willing and able to produce lower cost terminals and other peripherals in 1964 than IBM's current product line, according to a memo from G.W. Tuttle to J. McDermott entered as evidence in the U.S. vs. IBM trial here.

The memo outlining the division's capabilities was issued July 17 in response to the System 360/Compatibility Committee's expectation of plug-to-plug competition in both the peripherals and systems areas [CW, Sept. 5].

McDermott was chairman of the processor group of the compatibility committee and Tuttle was a member of the I/O group.

The memo contained recommendations from the Product Review Board of the I/O Division.

The I/O Division was also developing a "flexible file" with a capacity of up to 11 million characters.

"We feel in looking over our laboratories that we can develop a complete line of terminal equipment at more than 20% off IBM prices. Evidence that this can be done has been shown by the Friden Collectadata, the Tele-Register 200 and the Teletype Data Speed.

"In addition, we are planning to spend additional development dollars for industry-oriented terminals," Tuttle's memo said.

The I/O Division planned to make tape drives that it considered to be attractively priced for use in conjunction with the 360. The prices per drive were about $100 less than those quoted for current IBM drives.

The controller for printers and I/O equipment proposed by the division would be a nonprofit item priced at about $600 compared with the IBM existing price of $1,045.

"We will continue our development work, however, on a flexible file with a goal of $475 to $675 with a control price of $350. This file will have a capacity of up to 11 million characters and would compete with the 2311 which rents for $575 with the control at $525 and a capacity of 14.5 million," the memo said.

Interim Relief Seen Trial Option

(Continued from Page 65)

Justice could conceivably file such a motion at the time Edelstein announces his decision, he said. Edelstein's ruling will probably favor the Justice Department, Crary added.

He expects IBM to file for summary judgment and added he would be very surprised if Edelstein granted that.

Commenting on the Ninth Circuit Court of Appeals' decision remanding the Greyhound Computer Corp. vs. IBM antitrust case back to trial, Peacock said it could open the door for more settlements between various plaintifs and IBM.

He declined to speculate on whether the Justice case might also be a candidate for settlement. The stakes are bigger and the process interminable, he commented.

However, he said, the others all will settle if the price is right.

The Ninth Circuit's extensive opinion seemed to clarify a lot of issues in the cases from a legal point of view and should certainly improve the atmosphere for settlement by IBM of some or more of the cases, he said.

The decision in the Greyhound case means it is very likely the California Computer Products, Inc. vs. IBM case will also go back to trial. In addition, "now Memorex knows what kind of atmosphere it is looking at up the ladder, so the signs are not great for IBM, which might be more willing to settle some cases," he observed.

The Ninth Circuit is also the appeals court for the Memorex and Calcomp cases, he noted.

Extensibility Seen Trend In Industry

PORTSMOUTH, N.H. — "The overriding trend (in the computer industry) can be characterized as 'computer extensibility,'" according to Jerome Kanter, Honeywell Information Systems' product director for minisystems.

"Computers and electronics are reaching out more and more — from individual company sites to intracompany remote networks to intercompany/interindustry systems . . . Computers are reaching and influencing small elements of the community such as the auto parts dealer, the gasoline station attendant, the small business merchant, the professional man and even the household," Kanter said.

"This extensibility is made possible by the computer trends of transaction processing . . . networking and distributed processing," he added.

Most enterprises are constantly considering two major managerial decisions concerning data processing: whether DP functions should be centralized or distributed, and whether managerial control of these operations should be centralized or distributed, Kanter told a group of financial analysts at the Mini/Micro Industry Conference here recently.

Looking toward the future, Kanter said that both the OEM and system builder "want the mini vendor to furnish more of the basic hardware and software for their systems. They can then concentrate on . . . doing what they do best, whcih is application software, industry know-how and specialized marketing capability.

"Frankly," Kanter continued, "this allows us to do what we do best, which is providing more pieces of the system."

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DBL Cites Problems

Reports of Japanese Threat Called 'Exaggerated'

By Toni Wiseman
CW Staff

NEW YORK — The Japanese computer industry's threat to IBM and other U.S. manufacturers has received a great deal of coverage, but that coverage has been largely one-sided and exaggerated, according to a report published by Drexel Burnham Lambert, Inc. (DBL).

In fact, the report listed 17 separate reasons why the Japanese may not be so tough.

The report acknowledged several truths: the Japanese government has "(1) organized consortiums of computer companies, (2) assigned specific tasks to each company, (3) subsidized computer R&D, (4) purchased domestically made computers almost exclusively and (5) provided financing for companies leasing Japanese computers."

International News

However, without wishing to belittle the Japanese threat, DBL emphasized that "formidable obstacles stand in the way of Japan, Inc." and that in its opinion "the brouhaha about the potential impact of Japanese exports on U.S. computer manufacturers has been exaggerated."

The report pointed out, for instance, that while several countries have successfully competed with Japan for various export markets, such as Germany and automobiles, only the U.S. has ever successfully exported computers.

In addition, computers are more complex than any other product that Japan has successfully exported, it said.

Software is a third problem for the Japanese. "Japan may have caught up with the U.S. in hardware, but industry experts acknowledge that Japan is still far behind in the development of software,"DBL stated.

The report also suggested the Japanese might face language problems in Western Europe, which Americans would not since English is widely spoken.

"The language barrier does not pose a serious problem when selling consumer or price-oriented products; however, it presents a formidable obstacle when selling complex products, such as computers," the report indicated.

And then there is IBM. IBM's recently announced 3033 has 2.5 times the price/performance of a 370/168-3, the report noted, adding this is the market the Japanese will be competing in since, in 1976, 57% of the Japanese installed base was large-scale systems.

DBL saw service as another possible problem for the Japanese. "A network of maintenance centers is a prerequisite for selling computers in quantity," it said, but "a maintenance network is hard to start, difficult to staff and expensive to support."

Depressed Stocks

"In recent months, the stocks of American multinational companies have been depressed because of fears of foreign nationalism and lagging economic growth overseas," DBL stated.

"Those same problems would affect Japan, Inc. even more than [its] U.S. counterparts, yet the Japanese threat appears to remain undiminished in the eyes of many analysts.

"Moreover, in most countries, U.S. companies have become firmly entrenched and tolerated, while the Japanese have become unwelcome because of their surging exports and resulting trade imbalances.

"Japanese computer exports represent a threat to the status quo and, ipso facto, the health of struggling foreign computer companies."

While many view Japanese government subsidies as an added threat to the U.S. market, the report observed that many of these subsidies cannot be transferred abroad — i.e., government purchases of Japanese computers and financing of domestic leasing firms.

"So although the Japanese computer industry has enjoyed considerable success at home, it may not be indicative of the potential for success overseas," the report said.

In fiscal 1976, Japan produced about $2.5 billion in computer equipment, of which $71 million was exported, the report noted. Even if exports grew at the government's goal of 30.4% per year, Japanese exports would reach only $1 billion by 1985, a year in which IBM revenues should be about $50 billion, according to DBL.

"Moreover, a portion of Japanese computer exports will go to markets not heavily served by U.S. companies, such as China and Korea. . .In any event, weak foreign computer companies will very likely suffer proportionately more than U.S. computer companies if Japan, Inc., were successful," the report stated.

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International News

EMM Expands in Europe

Special to Computerworld

BAD HOMBURG, W. Germany — As an extension of its expanded commitment to the end-user business, Electronic Memories & Magnetics Corp. (EMM) has expanded the European operations of its Computer Product Division.

The success of its add-on memory business philosophy in the U.S. has prompted the independent supplier of add-on memory to capitalize on the potential abroad, it said.

EMM started this foreign expansion with what it already considered a strong market position. It has established EMM GmbH as its European divisional headquarters here. The sales and service operations are directed from this centrally located area, which also has easy access to Eastern Europe.

The sales staff presently operates from Germany. However, additional salesmen will be appointed in the near future and will be located in major market areas. The company also has appointed agents in the UK, Switzerland and Austria.

Reference selling is important in Europe and the company believes it is in a good position to draw on its current customer base and parlay that success into bigger and better things. Major installations are already in Swiss and French banks, a major German automobile manufacturer and a major European airline.

Also included are one of Germany's more prominent breweries; a large construction company; one of the world's largest multinationals; and Eurocontrol, the air traffic control operation built by the common market countries and the North Atlantic Treaty Organization. Products installed cover a wide variety — from IBM 360/65s to 370/168s — with as much as 5M bytes of memory.

Eastern Market

In addition to this list, EMM has three orders from Rumania and one from the USSR. The Eastern European market appears to have enough profit potential for EMM to position itself accordingly, a spokesman stated.

Under the direction of Dieter Huhn, European sales manager, the headquarters has been staffed with "a number of people whose expertise is commensurate with the company's overall commitment," according to the spokesman.

The staff personnel offer varied backgrounds in engineering, sales and marketing — including past associations with IBM, Siemens, 3M and CMI.

EMM is looking to this European operation as a key element in future growth plans, the spokesman said.

Foreign Orders & Installations

The Centro de Investigacion Cientifica y Educacion Superior de Ensenada, a scientific research and educational institution funded by the Mexican government, has ordered a Prime Computer, Inc. Prime 400 computational timesharing system to be used for seismic and oceanographic analysis projects.

The Overseas Fixed Telecommunication Service has ordered Codex Corp. 6000 Series Intelligent Network Processors and LSI high speed data modems worth over $1,000,000.

Toyota Auto Body Co., a Japanese automobile body manufacturer, has ordered a Univac 1100/11 system for use in on-line control system covering planning, phototype production, testing and preparation of new cards.

The Telephone Authority of Singapore has ordered 300 medium-speed modems from General Datacomm Industries, Inc.

The Australian Broadcasting Commission has ordered two PAL version Compositor 1 systems from TeleMation, Inc. to be used for graphics geneation in their Melbourne and Sydney stations.

International Studies Set

MANCHESTER, England — The Council of the European Communities has approved a group of studies in support of the use of data processing which will be carried out in collaboration between The National Computing Centre in the UK, Gesellschaft fur Mathematik und Datenverarbeitung (GMD) in Germany, Institut de Recherche d'Informatique et d'Automatique (Iria) in France and Consiglio Nazionalle Delle Ricerca (CNR) in Italy.

The studies, which cover work related to privacy and security, data base and programming techniques, will be financed half by the European Economic Community (EEC) and half by the various nations concerned.

Given approval for the further stages currently envisaged, the cost of the entire program for all four countries will probably total about $1.4 million.

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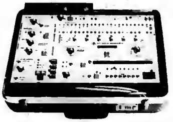

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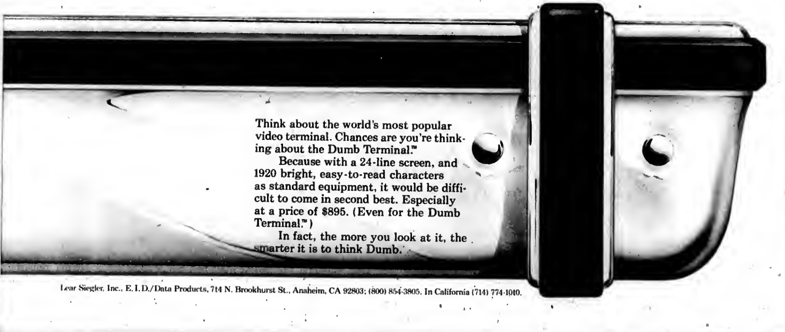

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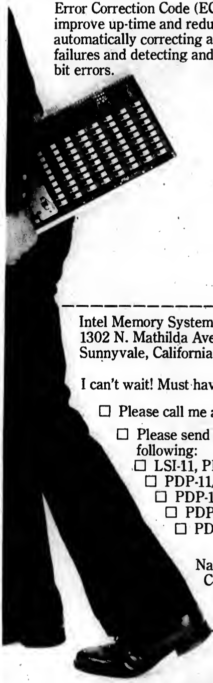

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Adapso Sets Theme

SAN FRANCISCO — "Responding to Change —A Program of Action" is the theme for the Association of Data Processing Service Organizations' (Adapso) 47th Management Conference.

The conference, which will be held in conjunction with Adapso's first computer services industry exposition, will take place at the Hyatt Hotel on Union Square here Oct. 19-21.

Workshop topics will range from "User Panel: Why Buy Computer Services," "Running a Small Data Center for Profit" and "How to Make Money in the Mini-Micro-OEM Marketplace" to "Taxation," "Acquisition Strategy" and "Is There Any Accounting for Software?"

There will also be general sessions dealing with communications activities, security and the computer services industry and IBM and the U.S. computer services industry.

Registration for the conference is $195 for Adapso members and $295 for nonmembers, with discounts for additional registrants from the same company. Further details are available from Adapso at 210 Summit Ave., Montvale, N.J. 07645.

Acquisitions

Dun & Bradstreet has agreed in principle to acquire **Technical Publishing Co.**, publisher of *Datamation*, for Dun & Bradstreet stock with a current market value of about $45.6 million.

TRW, Inc. has acquired **Gier Electronics GmbH** of Hanover, a German distributor of American DP equipment.

Perkin-Elmer Corp. and **Physical Electronics Industries, Inc.** have merged. Under terms of the agreement, four shares of Perkin-Elmer common stock will be exchanged for each share of Physical Electronics common, resulting in the issuance of approximately 540,000 shares of Perkin-Elmer common. Physical Electronics will operate as a wholly owned subsidiary of Perkin-Elmer.

Systems Dimensions Limited (SDL) has received a formal offer from **Sun Life Assurance Co. of Canada** to purchase all common shares of SDL at a price of $4.50 (Canadian) per share.

Itel Corp. has acquired certain assets of **Bankputer Corp.** for an undisclosed amount of cash.

Medical Computer Systems, Inc. has agreed in principle to acquire all of **Health Management Corp.'s** 1,040,000 common shares outstanding through a swap of stock.

Digilin, a manufacturer of digital panel meters, has been acquired by **Dynamic Sciences, Inc.** for cash.

Membership Still Open In Battelle EFT Program

WASHINGTON, D.C. — If you supply or are interested in suppliers of electronic funds transfer (EFT) systems, you might want to investigate a research program currently being conducted by Battelle Memorial Institute.

Titled "A Worldwide Study of Electronic Funds Transfer Systems and Equipment Requirements," the proprietary project is the third in a series of international payment systems studies run by the institute.

Co-sponsored by several supplier organizations, the study will analyze the market for EFT delivery systems and components within selected countries.

EFT models will be developed for each nation investigated, including Belgium, Canada, France, Germany, Italy, Japan, The Netherlands, Spain, Sweden, Great Britain and the U.S., according to Joanne Hartley, the project's manager.

An initial interactive workshop session with the sponsors has been held at Battelle Columbus Laboratories, but membership in the program is still open, Harley said.

In profiling the worldwide markets for EFT delivery system components, the Battelle project team will analyze global issues that affect all suppliers as an industry, as well as specific issues which affect different supplier types, Hartley said.

Among the issues to be investigated are standards, security, communications traffic, transitional technologies and functional specifications for EFT equipment, Hartley said.

The institute hopes for as much interaction as possible between the clients of the study and its project team.

A major Battelle objective is to determine what experience or technology might readily be transferred from one country to the next, the project manager stated.

The sum of $18,000 and participation will give you a full sponsorship in Battelle's study. Further information is available from Hartley at the institute's Washington operation, 2030 M St. N.W., Washington, D.C. 20036.

CCIA Reelects Amdahl

WASHINGTON, D.C. — Dr. Gene M. Amdahl, chairman of the board of Amdahl Corp., has been unanimously reelected chairman of the Computer & Communications Association's (CCIA) board of directors.

Four regional vice-chairmen were also elected: Timothy C. Cronin, chairman of the board of Inforex, Inc., for the eastern U.S.; Harold E. O'Kelley, president of Datapoint Corp., for the central U.S.; Ryal R. Poppa, chairman of the board of Pertec Computer Corp., for the southwestern U.S.; and Richard Lussier, executive vice-president of Itel Corp., for the northwestern U.S.

A.G.W. Biddle was reelected to the post of CCIA president.

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DDP Seen Making Users More Independent

BOSTON — As the industry moves toward distributed processing, users will and should become considerably more independent than they have been traditionally, according to an NCR executive.

"They no longer see themselves tied to a particular vendor," G.P. Williamson, an NCR marketing vice-president told a group of electronics analysts here recently.

"In fact," he said, "the particular vendor to whom they are most likely tied has not, typically, been a leader in moving into distributed processing. More likely than not, when today's user begins implementing a distributed processing network, he will be moving into a non-IBM world."

Williamson said, the key element in distributed processing is the inclusion of a distributed data base. "It means that not only is processing power distributed to whomever needs it, but also that the data base is distributed along with responsibility for the system."

Distributing responsibility for the system to the end user, Williamson added, is one of the biggest reasons distributed processing will eventually become the dominant form of processing.

End User Responsibility

"Complete responsibility can be fully allocated to the actual end user of the system," he said. "The people who control the budget and put out the money will no longer have to handle DP as a single general-overhead type of account. They can allocate its cost to a specific end user, just as they allocate payroll or material costs today.

Also behind the trend toward distributed processing, Williamson said, is the reduction in processing costs.

"We are on a downhill cost curve so far as memory, processor and communications costs are concerned, and those lower costs are making possible different approaches to information handling.

"In the area of memory, charge-coupled devices and bubbles, now becoming commercially feasible, offer great potential for lowering costs in some applications. Fixed-head disk technology, solid-state storage, and helical-scan, mass-storage systems promise equally dramatic price/performance improvements in the area of auxiliary storage."

Although the trend toward distributed processing is very strong, it will be several years before it materializes on a wide, general scale, Williamson said.

One reason is that large CPU's still enjoy a price/performance advantage over small systems. "However, given the continuing decline in the absolute amount of cost difference in units of processor power between large and small computers, it is becoming increasingly attractive to exchange this large-system advantage in return for the efficiency gains achieved when information, processing power and the responsibility for them are placed where they are most needed," according to Williamson.

A second reason for distributed networks' not becoming widespread overnight, he said, is that the currently installed base of computer systems is primarily a centralized, batch-oriented base. "That investment in equipment and software cannot be lightly tossed aside. It will continue in place and will be enhanced. Existing equipment and systems continue to function; new systems will supplement, rather than replace current systems."

Williamson also cited the current lack of distributed data base software. "It is for that reason, more than any other, that today the industry finds itself primarily in an era of announcements so far as distributed processing is concerned. The technology is here and systems are in operation. Generalized systems are on the drawing boards and in fairly advanced stages. But the missing link is software. In the end, it will be software — data base software, terminal control software, networking software — that will determine success or failure in this field.

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The first issue of the Index for example, covers the last six months of 1976, and it includes more than 4,000 entries by subject, author and name of any company mentioned. It breaks topics down into highly usable and convenient categories:

• There are entries by *product or service*, like *PRINTERS*, which has 37 entries in the six-month period covered; or *LEASING*, which has 10.

• There are entries by *industry*, like *INSURANCE*, under which there are 17 entries for various stories on the use of computers in the insurance industry.

• *Types of computer applications* is another way you can look something up in The Index. The category *INVENTORY SYSTEMS*, for example, has 21 entries.

• *Regulatory, security* and *social issues* are also indexed. There are 34 entries under *PRIVACY*, 10 under *PRIVACY ACT* and 9 under *PRIVACY PROTECTION COMMISSION*, for example.

• The Index also makes it easy to look into *legal aspects of computer use* with categories like *LITIGATION*, which has 24 entries in the last six months of 1976.

• Even *foreign countries* are indexed. The category *JAPAN*, for example, has 9 entries.

• . . . and there are *others: KIT COMPUTERS* (the kind you build yourself) are the latest thing, and The Index shows 5 entries. *POINT-OF-SALE SYSTEMS* has 14 entries . . . and there's much, much more.

Company Names, for example, are a very important part of The Index. Looking under IBM, we find *ten* categories:

• IBM GENERAL • IBM HARDWARE
• IBM LITIGATION • IBM PRICING
• IBM SOFTWARE • IBM POLICY
• IBM SYSTEM 3 • IBM SERIES 1
• IBM SYSTEM 7 • IBM SYSTEM 32

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT.
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System 'Free' With Software

IRVINE, Calif. — Liberal Computer Corp. is promoting the concept of "rebundling," according to chief executive officer Bernie Lumbert.

The firm plans to provide a microprocessor-based system free — along with the $200 monthly rental fee for software, he said. There will be an additional charge for customized software, he added.

Liberal's product will be called the "Generous/1" and will consist of a Motorola 6800 with 32K, a Shugart floppy disk drive, a Lear Siegler CRT and AT&T's Dataspeed Model 43, he said.

Initially, Lumbert plans to concentrate on the word processing and text editing area and then broaden into small business applications such as general ledger, he said.

More specifically, he said, he is looking at the mortgage banking document area as well as packages for small banks.

The time has come once again for "rebundling," he said, noting Eastman gave away cameras and Gillette gave away razors when starting their businesses.

Liberal Computer Corp. is at 4301 Birch, Newport Beach, Calif. 92660.

GAINING MANAGEMENT CONTROL OF TSO

. . . a seminar for EDP professionals interested in systematically planning, controlling, and evaluating the use of TSO.

. . . presented by Mario Morino of MORINO ASSOCIATES, INC.

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COMPUTER MANAGEMENT
UNITED KINGDOM

World rank as DP market: *Fourth*
1975 DP expenditures: *$2.7 Billion*
1975 imports from US: *$270 Million*
Rank as importer from US: *Third*

Computer Management is a monthly magazine recently purchased by *Computerworld, Inc.* Monthly circulation is 30,000.

COMPUTERWOCHE
GERMANY

World rank as DP market: *Third*
1975 DP expenditures: *$3.7 Billion*
1975 imports from US: *$274 Million*
Rank as importer from US: *Second*

Computerwoche is a weekly tabloid newspaper started by *Computerworld, Inc.* It has a circulation of 21,000 to the West German computer community.

SHUKAN COMPUTER
JAPAN

World rank as DP market: *Second*
1975 DP expenditures: *$4.6 Billion*
1975 imports from US: *$189 Million*
Rank as importer from US: *Fifth*

Shukan is a weekly tabloid newspaper, jointly owned by *Computerworld* and Dempa publications. Circulation is 35,000.

ZERO-UN INFORMATIQUE
FRANCE

World rank as DP market: *Fifth*
1975 DP expenditures: *$2.5 Billion*
1975 imports from US: *$223 Million*
Rank as importer from US: *Fourth*

Computerworld represents Zero-Un Informatique in the US. Zero-Un has three publications, one a weekly tabloid newspaper with circulation of 22,000; the second a monthly magazine, circulating 13,000 copies; and a new bi-weekly, Minis and Micros. All circulate throughout Europe's French speaking computer market.

DATANEWS
BRAZIL

World rank as DP market: *12th*
1975 DP expenditures: *$250 Million*
1975 imports from US: *$60 Million*
Rank as importer from US: *(Est) 10th*

DataNews is a bi-weekly tabloid newspaper in Portuguese with an English-language summary. It is owned by *Computerworld, Inc.* and has a circulation of 7,000.

Computerworld now has sister publications in five leading international markets for US computers and computer-related equipment. These markets import in excess of a billion dollars of US-made computer products. The publications are operated and edited by local experts, and published in the language of the computer people they serve. And they do an excellent job of covering their markets.

To advertise in any of these publications, all you have to do is contact us at *Computerworld*. We can take care of everything, including translation and resetting of your English-language ads. And our International Marketing Services Division can also help you arrange a broad range of marketing services, from market potential studies to marketing operations set-up.

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Company__________
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POSITION ANNOUNCEMENTS

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COMPUTING SERVICES OFFICE
URBANA CAMPUS

THE FOLLOWING POSITIONS ARE OPEN WITH THE COMPUTING SERVICES OFFICE:

Computing Documentation Writer

This full time position involves the writing/editing and maintenance of a large scale user document for the services offered on a CDC CYBER 175 and an IBM 360/75. A knowledge of computer programming, experience with time-sharing systems, a university degree with a background in communication arts and experience in composing and/or editing computing documentation are required. The position offers avenues for imaginative expression and initiative. Initial salary: $11,000 to $13,000.

Statistical Computer Consultant

This full time position for a statistical computing consultant involves the research, development and maintenance of statistical software on the CDC CYBER 175 and IBM 360/75 computers. The ability to help computer users with statistical computing is of prime importance. This individual should also have the following qualifications:

- General statistical knowledge a must, while experience with statistical software (SPSS, SOUPAC, SAS, BMD, etc.) desirable.
- Programmer/analyst experience with FORTRAN a must, while knowledge of CDC NOS and IBM OS operating systems desirable.

All applicants should have at least one year of experience in the areas described above, and have a university degree with a background in statistics and computer science or closely related fields. Initial salary: $11,000 to $15,000.

Research Programmer—Senior Research Programmer

This full time position is for an individual with demonstrated skills and achievements in at least one of the following areas:

- CYBER 175 NOS systems programming, development, and performance analysis.
- IBM 360 HASP-OS/MVT systems programming performance analysis and maintenance.
- DEC PDP-11 systems programming and hardware development, with an accent on on-line applications.
- Systems measurement and quantitative performance analysis.
- Synchronous and Asynchronous data communications measurement, analysis and development. Knowledge of CDC 2550 desirable.
- Development and implementation of large storage hierarchies.

All applicants should have at least two years experience as a systems programmer, and have at least a bachelor's degree with a strong mathematical basis. Initial salary: $12,000 to $18,000.

SEND RESUMES BY SEPTEMBER 30, 1977 TO:

Director, George F. Badger, Jr.
Computing Services Office
150 Digital Computer Lab.
University of Illinois
Urbana, Illinois 61801

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PROGRAMMERS

SYSTEMS PROGRAMMERS

Fluor Corporation, a dynamic and internationally respected leader in the engineering and construction field, has immediate openings for CDC Cyber 170 systems programmers with SCOPE OR NOS/BE experience.

OPERATING SYSTEM SUPPORT

- A minimum of 2 years' experience maintaining a CDC SCOPE 3.4 or NOS/BE operating system
- Proficiency with CP and PP COMPASS
- Experience in analyzing dumps from system failures and generating/locating corrective codes
- Familiarity with basic internals of SCOPE or INTERCOM

The individuals selected must be able to maintain a stable version of NOS/BE at current PSR levels. Additional duties will include installation of local modifications, evaluation of system performance and user consultation.

PRODUCT SET SUPPORT

- A minimum of 2 years' experience with internals of compilers and compiler object time routines
- Proficiency with CP COMPASS and/or SYMPL
- A working knowledge of FORTRAN and COBOL

The individuals selected will be responsible for maintenance of product sets, installation and testing new versions supporting applications programmers, writing utilities and specialized subroutines in the area of application support.

Our employees enjoy excellent benefits including profit sharing and savings investment program. Positions are located in our new innovatively designed facility in the Newport Beach area. Relocation allowance available.

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Santa Ana, CA
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This key position requires a demonstrated ability and adaptability with a wide range of mini-computer executive/operating systems at the conceptual, design and implementation stages.

Applicants should have the ability to anticipate problems and conceptualize solutions in the following areas of involvement.

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Opportunity to move to Florida. We are the largest teaching hospital and we offer challenging opportunities for programmers with the following background:

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1-3 years experience in financial systems with heavy accounting background using COBOL. Some CICS experience helpful.

CICS PROGRAMMER

1 year CICS in applications programming in BAL. Some DL/I experience helpful.

SYSTEM PROGRAMMER

Actual systems software experience in IBM DOS-VS environment including systems generation of DOS-VS and/or CICS is required. CICS experience preferred.

We offer excellent salary and benefits plus an opportunity for personal and professional growth. Send detailed resume, including salary history and availability in strictest confidence to:

Ms. Cynthia Robinson
Employment Office
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HOSPITAL
1611 N.W. 12th Avenue
Miami, Florida 33136
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Data Processing Professionals

At Motorola we offer exciting and rewarding careers to dedicated and experienced data processing professionals who are anxious to become associated with a company whose history is one of well planned growth and whose future is assured by an investment in superior products in an ever expanding market.

If you combine imagination, education, and experience and want to channel it in an environment where you can enjoy the freedom to excel, to offer suggestions and recommend changes, we at Motorola can offer the following career opportunities with Corporate Information Systems:

BUSINESS SYSTEM ANALYST

Must be effective in understanding and designing logical, well structured systems to satisfy identified financial business problems and have the ability to provide an effective link between the user and data processing departments. Good accounting or payroll/personnel background and communication skills is necessary.

SENIOR PROGRAMMER

3 to 5 years experience in using COBOL, JCL, programming utilities and interpreting core dumps on large IBM/370 equipment utilizing OS/VS; assembler language and DL/1 coding experience a plus. Prior computer system work should include Fund Accounting or Employee Benefits Systems.

MAINTENANCE PROGRAMMER

Minimum of one year in maintenance programming with a thorough understanding of OS/VS2, JCL, catalogued procedures and utilities, program debugging and OS/VS2 dump reading. Requires experience with IMS/VS Data Base and/or Data Communication. MARK IV experience and working knowledge of TSO a plus.

DATA BASE ADMINISTRATOR

Minimum two years experience in Assembler Language Coding, IMS Data Base and Data Communications Coding, IMS Data Base Design, COBOL Programming. Working knowledge of a Data Dictionary System, TSO programming debugging and OS/VS2 Dump Reading.

For immediate consideration, forward resume in complete confidence to:

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1303 E. Algonquin Rd.
Schaumburg, IL 60196

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New Careers in Software

San Francisco Pensula

The creation of our new Software Technology Department in Special Programs Operation at Ford Aerospace and Communications Corporation has resulted in a need for a number of senior analysts or computer systems specialists. The individuals we are looking for will have advanced degrees and/or three years' experience in one or more of the following disciplines:

- Software engineering/software development methodology
- Data base management/distributed processing
- Image processing
- Minicomputer based systems (PDP-11, SEL 32, Eclipse)
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Responsible for systems generation, maintenance and development of the SHADOW II teleprocessing monitor; back-up programmer on the college's ITEL AS/5-3 CPU. Qualified applicants must have in-depth experience with OS/MVT or SVS/HASP systems programming and with IBM 3270, SHADOW II, CICS or other major teleprocessing package. Bachelor's degree in appropriate field from an accredited institution and five years experience or an equivalent combination of education and experience. Salary competitive. Liberal employee benefits. Submit detailed resume including salary requirements to Personnel Services, Miami-Dade Community College, 11011 S.W. 104 Street, Miami, FL 33176. An Equal Access/Equal Opportunity Community College.

CSC

PROGRAMMER ANALYSTS

Let's Talk About Your Future With CSC's SYSTEM SCIENCES DIVISION

Naturally, you are seeking an opportunity that will capitalize on your education, training and experience . . . a dynamic position that will offer a steady flow of career-building assignments that challenge the best that's in you.

You'll find all this and more with CSC's System Sciences Division where we are deeply involved with several projects for which we are seeking skilled and imaginative Programmer/Analysts. One is an FAA assignment to develop and implement Air Traffic Control Systems; the others are in support of NASA projects . . .

AIR TRAFFIC CONTROL SYSTEMS

We are seeking experience on IBM 360/OS or Minicomputers (XDS-Sigma series preferred) in any one of the following areas:

- Simulation/modeling of air traffic patterns. Knowledge of JOVIAL a plus
- Design and implementation of data base management systems
- OS/360 System generation and maintenance
- Diagnostic design, development or enhancement and hardware orientation
- Software test and validation including development of tools to test and validate real-time software systems
- Software Quality Assurance
- Performance Analysis & Modeling
- Human Factor Studies (N.J. only)

Assembly (BAL) and/or high level language (preferably JOVIAL) highly desirable.

Positions are available in Atlantic City, New Jersey or Jacksonville, Florida.

SPACE SCIENCES

Current positions in support of our Goddard Real-Time System, Spaceflight Tracking Data Network and On/Off Site Project for the NASA Goddard Space Flight Center require a degree in Computer Science, Math, Physics, Astronomy, Meteorology or Engineering with experience using FORTRAN and/or Assembly languages on large-scale or mini-computers. These skills will be applied in the following concentrations:

- Telemetry application with multi-computer configuration
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- Data base management
- Real-time scientific applications
- Network management
- Computer-to-computer communications
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- Simulation/modeling of real-time systems
- Optical Analyst (MS, PhD-Physics or Astronomy)
- 360/370 OS systems programming

CSC offers a liberal relocation policy in addition to a complete benefits package. For immediate consideration; please send resume or call:

Staffing Department

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COMPUTER SCIENCES CORPORATION

System Sciences Division
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PROGRAMMERS PROGRAMMER/ ANALYSTS

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PROGRAMMERS

L'EGGS PRODUCTS, INC., an operating unit of the Hanes Corporation, has immediate openings for Programmers in its Winston-Salem, North Carolina headquarters and in its Atlanta, Georgia Data Processing Center.

Successful candidates will have a minimum of 1-2 years programming experience in COBOL, preferably on Honeywell 6000 utilizing TSS.

We offer a competitive salary and benefits package and the opportunity for professional growth with a dynamic, growing company.

Reply in Strict Confidence, INCLUDING SALARY REQUIREMENTS and LOCATION PREFERENCE to:

Fritz Morrison
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P.O. Box 2495;
Winston-Salem, N.C. 27102
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EDP OPPORTUNITIES

Blue Cross/Blue Shield of North Carolina has immediate openings, due to increased business, for top data processing professionals.

EDP AUDITORS:
Primary responsibility is the ongoing review of EDP activity to evaluate and report on the adequacy of internal controls in existing and proposed systems. IBM environment. On-line and off-line applications and data base files. One year minimum experience. Salary range to $18K.

PROGRAMMER ANALYSTS/SYSTEMS ANALYSTS:
Minimum of two years' COBOL programming experience preferred. Exposure to on-line systems in an IMS data base environment a plus. Operating under OS/VS: IBM 370/165. Salary range: $14K-$20K.

SYSTEMS PROGRAMMERS:
Teleprocessing specialists with minimum three years' experience. Thorough knowledge of OS Assembler Language. Any of the following desired:

VTAM
NCP/SDLC
PEP
BTAM
IBM 3705 HARDWARE
IBM 3790 HARDWARE
IMS/VS

Salary Range: $14K-$20K

These positions are located in our North Carolina home office near beautiful Chapel Hill, N.C. Excellent company benefits and growth potential for career advancement.

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Attention: Personnel Manager
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Durham, N.C. 27702
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Grow with Amdahl and be a part of the future.

Software Opportunities

Are you good at diagnosing system level problems? Amdahl needs...

FIELD SUPPORT REPRESENTATIVES

You should be able to work on your own in the resolution of complex system level problems encountered by Amdahl users. You should have good MVS internals experience plus expertise in one or more of the following components or subsystems:

- VTAM/NCP
- JES3
- IMS
- VSAM
- TCAM/TSO
- CICS

We also have a very limited number of positions available for those select few highly motivated, technically inquisitive application programmers seeking a career in systems programming. Prerequisites are total proficiency in ALC plus one higher level language and a good knowledge of the relationship between major components of an IBM virtual SCP. Current openings are in the San Francisco Bay Area.

Can you accept the challenge of creating an error free system? How: by building test cases that really put all operating system components through a real test. If so, Amdahl needs you as a...

SOFTWARE QUALITY CONTROL SPECIALIST

to generate, apply and verify VS1, SVS, VM or MVS software and material distributed to our Amdahl customers. You should have a close working knowledge of the VS1, SVS, VM or MVS operating system internals, utilities, SMP and assembler language. Current openings are in the San Francisco Bay Area.

Can you build a better mousetrap? Amdahl needs...

SOFTWARE SYSTEMS MAINTENANCE SPECIALISTS

to create all Amdahl SCP maintenance materials. You should possess a detailed knowledge of the VS1, MVS, VM or SVS operating system internals as well as a good working knowledge of utilities, SMP and assembler language. Current openings are in the San Francisco Bay Area.

Do you enjoy customer contact? Amdahl needs...

FIELD SYSTEMS ENGINEERS

at customer locations. You need the ability to handle problems encountered on a daily basis in a large commercial data processing environment. You should have good diagnostic expertise in VS1, SVS, VM or MVS and the ability to be a jack-of-all-trades. Currently there are several openings throughout the United States.

Do you enjoy traveling? Amdahl needs...

HEADQUARTERS SYSTEMS ENGINEERS

to work with Field Systems Engineers at customer locations solving difficult problems. You will also assist customers and Field Systems Engineers in the complex area of system performance and tuning. You should have very good diagnostic techniques and MVS, VS1, VM or SVS internals experience. Current openings are in the San Francisco Bay Area.

Have you been active in recent MVS conversions? Amdahl needs...

MVS CONVERSION SPECIALISTS

to work closely with Field Systems Engineers and Amdahl customers converting to MVS. You should have several years' MVS internals and externals experience, as well as either JES2 or JES3 expertise. Opportunities available for extended travel. Current openings are in the San Francisco Bay Area.

Do you enjoy teaching? Amdahl needs...

SYSTEMS ENGINEERING INSTRUCTORS

to teach MVS or JES3 classes for our Field Systems Engineers. You should have current experience teaching MVS or JES3 internals. Current openings are in the San Francisco Bay Area.

ASP/JES3

Amdahl is looking for people with detailed knowledge of ASP or JES3. Opportunities exist in many functional areas of system programming. Current openings are in the San Francisco Bay Area and throughout the United States.

ACP

We are building our team to support those customers who utilize this specialized high performance DB/DC system. You must have an intimate knowledge of CP internals and be well versed in the application as well. Current openings are in the San Francisco Bay Area.

Send your resume to Phil Beckhelm, Amdahl Corporation, Department A01, 1250 East Arques Avenue, Sunnyvale, CA 94086, or call Tony Price collect at 408/735-4500 between 9:00 AM and 5:00 PM. We are, of course, an equal opportunity employer.

amdahl

COMPUTER SYSTEMS ANALYST-MEDICAL

Responsible for design, implementation and coordination of hospital computer applications for an IBM System 370/145 at the University of South Alabama Medical Center Hospital in Mobile. All hospital programming personnel will be responsible to this position. College degree and 3 years' of progressively responsible experience in hospital systems analysis required. Experience with DOS/VS and CICS/VS desired. Gulf Coast location. Excellent benefits package. Salary commensurate with experience. Apply by resume only to:

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An expanded range of business and manufacturing applications coupled with the progressive technical environment of an innovative leader in the chemical processing industry makes this an oustanding opportunity for the Programmer/Analyst seeking to step up to Senior level responsibilities.

Working within the frame work of our digital equipment PDP-11 RSTS/E system, you'll participate in systems analysis, program design, coding and ohter programming tasks; BS in computer science or math and an exposure to interactive on-line applications would be considered essential for success.

Competitive salary, full benefits and extensive opportunities for career advancement accompany this position with our dynamic team DP professionals. For confidential consideration, forward resume with earnings history to:

William Stephan
Staff Personnel Administrator
P.O. Box 1123
Dayton, Ohio 45401

CHEMINEER, INC.

Equal Opportunity Employer M/F

We're Staffing for a Major DP Expansion

We're W.W. Grainger, a rapidly growing distributor of electrical motors and equipment and are currently taking major steps to expand our IBM 370/158 OS/VS1 installation using CICS to meet current and future business demands. Accompanying this growth is an ambitious plan for new systems development offering unlimited opportunities for professional and technical betterment.

Systems Analyst

A degree coupled with a 3-5 year background in accounting systems that documents achievements in project leadership is essential. Strong interpersonal skills are a must.

Programmers

Openings exist for Senior and Junior Level Programmers as well as Programmer Analysts. Proven ability in COBOL programming is mandatory. Any exposure to OS, JCL, CICS, or BAL would be helpful. Some college is desired.

Software Manager

This position requires 5 or more years in supporting operating systems through internal specification and a proven track record in supervising the software function. This key management position calls for strong leadership skills and the capability to interface consistently with top management.

Software Analyst

This position requires 2 or more years working with either OS/VS1 or CICS/VS internals. A history of achievements as a member of a software group is essential.

Professionals who join the Grainger team will find a highly technical and secure environment where individual contribution is quickly recognized and rewarded. Offered are excellent starting salaries and comprehensive benefits including profit sharing.

If your interested in taking a closer look at our advanced state-of-the-art installation, we invite you to apply. Send a resume or a brief letter outlining your background in confidence to:

Data Processing Manager — Office D-2
W.W. Grainger, Inc.
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W.W. GRAINGER, INC.

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data processing

PROGRAMMER/ANALYST

Foremost Insurance Company is the leading national mobile home and recreational vehicle insurer, with corporate offices located in Grand Rapids, Michigan. Our office complex is located in a picturesque suburban area with many excellent residential facilities available nearby. Grand Rapids has most of the advantages of a large city plus many recreational activities for after work and weekend enjoyment.

We have ultra modern facilities and up-to-date technology utilizing IBM 370/158, OS/VSII, ANS COBOL, with interactive programming. We are staffing for major development projects to begin this fall. Several openings exist in the following areas:

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The candidate must be able to write efficient and maintainable program modules from detail design specifications.

PROGRAMMER II

Candidate will be responsible for the writing of difficult or critical program modules plus translation of system requirements into program specifications. Will assist the project leader in providing functional guidance.

SYSTEMS ANALYST II

The applicant must be able to work well with user personnel, determine needs, define alternative solutions and develop conceptual and detailed system specifications. Will be required to assist in the management of the project.

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data processing

SYSTEMS PROFESSIONALS

First Federal of Chicago, the Midwest's largest savings and loan association, with a strong and continuous pattern of growth, is actively seeking systems professionals to develop new financial systems in conjunction with it's dynamic management team. Our operating environment consists of a 370/158-370/145 operating under OS/VS1/CICS driving a teleprocessing network of 250 on-line real-time terminals (and growing).

LEAD PROGRAMMER

For consideration, you will need a 2-3 year background as a programmer analyst or senior programmer, heavy experience in BAL and a working knowledge of COBOL, CICS and OS training. Any on-line real-time teleprocessing experience would be a plus. Primary emphasis will center on your interest in taking up professional project supervisory responsibilities as a lead programmer.

PROGRAMMERS

We wish to provide applications programmers with an opportunity to further develop and enhance their EDP backgrounds thru company-sponsored training on CICS. Programming requirements are 1-2 years BAL and OS expertise. Experience in an on-line real-time environment a plus. Major emphasis will be placed on new systems development.

In return for your technical know-how, you'll be additionally rewarded with an excellent starting salary that includes a comprehensive benefits package. Forward resumes in confidence, including salary history, to:

Manager/Employment
FIRST FEDERAL OF CHICAGO
P.O. Box 4444
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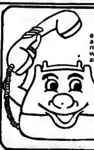

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Programming

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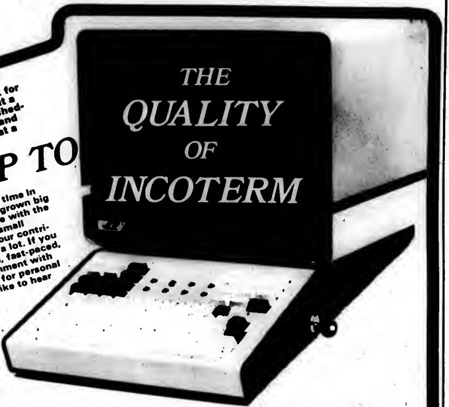

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This is a wonderful time in our history. We've grown big enough to compete with the big guys, but are small enough so that your contribution matters - a lot. If you like a controlled, fast-paced, exciting environment with plenty of room for personal growth, we'd like to hear from you:

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If you need to take charge and be given the opportunity to develop new computer systems the way it should be done, come and talk with INCOTERM. We need experienced, prolific, innovative technical leaders who want to immediately begin work on new product development. Skeptical because all growth-oriented companies are doing research and development? That's true, but at INCOTERM we have unique opportunities that may be just what you need in the way of professional satisfaction. Interviews with technical staff and the Personnel Department will be available at times convenient to you, any evening, and weekends as well.

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We have an immediate senior level opening for a person to monitor the status of software development being performed by outside vendors. This position will include technical evaluation of vendor produced specifications, the development of task requirements for outside consultants and the monitoring of software development tasks. This opening requires a high level of technical expertise as well as an ability to relate well to the various consultants. The successful applicant should expect assignments that require some travel.

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We have immediate openings for real-time assembly language programmers with mini-computer experience. These programmers will be heavily involved in the development of customer software for our users on our Intelligent Terminal Systems. Applications are in areas such as Banking Systems, Data Entry, Airline Reservations and other similar real-time terminal applications. These positions require a minimum of 3 years of experience.

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This job entails the successful candidate to lead a small group in the specification, design, code and testing of a contemporary mini-computer sized operating system. Are you an individual who has demonstrated the ability to put together non-trivial systems in an elegant and simple manner (as opposed to non-maintainable complex systems)? We need a strong individual who is willing to take charge in the building of an operating system.

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The successful candidate will be responsible for leading a group developing high-level language compilers, symbolic debuggers, assemblers and linking loaders. Proven compiler writing experience in block-structured languages such as PL/1 is necessary.

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Search Committee, Computer Center Director, c/o Graduate School, E-106 Martin Hall, Clemson University, Clemson, S.C. 29631. Closing date for applications is Oct. 31, 1977. Clemson University is an equal opportunity, affirmative action employer.

Senior Programmers

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Experienced digital hardware and software technical writers are needed to join in the development of TI's rapidly growing minicomputer business. Electrical Engineers and computer programmers with good writing skills should also apply.

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Harris Data Communications Division has an opportunity NOW for an individual with a minimum of 3 years field sales experience in data communications hardware or software, plus marketing staff experience and a high degree of analytical skills.

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Work into the mini-computer field with one or more years experience in any language. Develop systems in a variety of languages on several kinds of hardware. This is a highly interesting position for someone with limited experience. Salary area $18,000.

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Our client (Major Calif. Bank) needs Systems Analysts/Systems Programmers for S.F. and L.A. locations. Comp. 20-26K. Following experience is of interest: MIS Design, IMS, MICR, OS/MVT, MVS/JES III, ASP, Hdw/Software evaluation, Planning, and forecasting, and MBA. Reply in confidance to:

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Responsibilites: Adminster program in applied computer science; develop curriculum; advise majors; teach programming languages and systems design and analysis. Requirements: M.S. or Ph.D. in computer science, or M.B.A. Start as soon as possible. Rank and salary dependent on qualifications. Credentials to: Dean, College of Continuing Education, ROOSEVELT UNIVERSITY, 430 S. Michigan Ave., Chicago, IL 60605.

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Our Systems Architecture group seeks talented professionals to help design future high-performance computer systems. You should have a broad educational background in EE or CS with emphasis on computer architecture or design and be familiar with most of these areas: computer systems organization; storage systems organization; operating systems theory; assembler/high-level languages; data base fundamentals. Combined hardware and software experience and familiarity with system 370 is desirable. We have immediate openings for the following positions.

SENIOR SYSTEMS ARCHITECT

You will be a key decision maker on an architectural team. You have experience in either computer systems or operating systems architecture or design.

CONSOLE AND MAINTENANCE ARCHITECT

You will be responsible for the design of system consoles and work on system maintenance strategies. You have experience or aptitude in most of these areas: small and large computer systems; diagnostics; small operating systems and project management.

STORAGE SYSTEMS ARCHITECT

You will be key in defining the architecture of of future storage and data base sub-systems. You have experience in either of these areas.

SOFTWARE SYSTEMS ARCHITECT

You will be a software systems specialist on an architectural team. You have an architectural orientation and experience with operating systems/data base, preferably on system 370.

SYSTEMS ARCHITECT

You will be a member of an architectural team working on diverse investigations. This position offers tremendous educational and advancement opportunities. You have at least 2 years' related experience.

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You will be the performance specialist on an architectural team. You are a qualified professional in computer system performance measurement, evaluation and modeling with emphasis on architecture or design. Research into key areas of new product development will be a major responsibility.

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You will be responsible for the development of measurement methodologies to provide the measurement support of future product development. The position requires broad experience and knowledge of computer system operation, measurement methods and system modeling.

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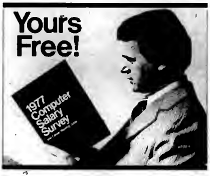

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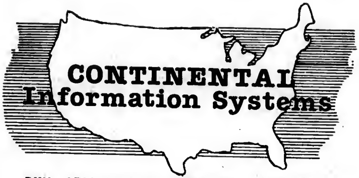

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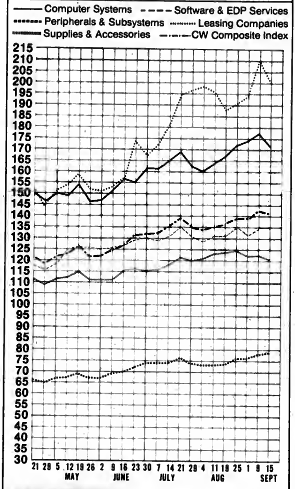

Earnings Reports

ELECTRONIC TABULATING
Six Months Ended June 30

	1077	1976
Shr Ernd	$.01	$.51
Revenue	1,765,071	1,743,728
Earnings	2,427	216,728

EMERSON ELECTRIC
Three Months Ended June 30

	1977 (000)	e1976 (000)
Shr Ernd	$.66	$.54
Revenue	478,483	395,408
Earnings	37,544	31,008
9 Mo Shr	1.64	1.54
Revenue	1,337,039	1,127,805
Earnings	105,961	88,602

e-Restated for acquisition of companies on pooling-of-interests basis and for change in accounting for foreign currency translations.

E-SYSTEMS
Three Months Ended June 30

	1977	1976
Shr Ernd	$1.79	a$1.13
Revenue	87,942,000	72,757,000
Earnings	4,669,000	3,112,000
6 Mo Shr	3.49	a2.04
Revenue	178,602,000	142,256,000
Earnings	9,129,000	6,582,000

a-Adjusted for 10% stock dividend in October 1976.

FOUR-PHASE SYSTEMS
Three Months Ended June 30

	1977	1976
Shr Ernd	$.62	$.61
Revenue	21,014,000	15,037,000
Tax Cred	702,000	717,000
Earnings	2,810,000	1,729,000
6 Mo Shr	1.20	1.21
Revenue	39,812,000	29,727,000
Tax Cred	1,527,000	1,336,000
Earnings	4,644,000	3,225,000

FOXBORO
Three Months Ended June 30

	1977	1976
Shr Ernd	$1.57	$1.41
Revenue	90,773,000	62,967,000
Earnings	8,302,000	7,380,000
6 Mo Shr	2.82	2.47
Revenue	170,496,000	167,430,000
Earnings	16,041,000	12,982,000

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West Germany
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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PPICES WEDNESOAY, SFPTEMBER 14, 1977

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTENS

E X C N		PRICE 1977 RANGE III	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE
D	ANDANL CORP	22- 44	40	-2	-4.7
N	BURRDUGNS COPP	55- 91	69 5/4	- 5/4	-1.0
O	CONPUTEP AUTONATION	18- 50	27 1/4	-1 1/8	-3.9
N	COMTROL OATA CORP	20- 26	20 1/2	- 5/8	-2.9
D	CRAY RESEARCN INC	15- 29	26	-2 5/4	-9.5
N	DATA GENERAL CORP	55- 51	47 1/4	-1 5/8	-2.8
N	DATAPOINT CORP	18- 32	30 7/8	- 5/8	-1.9
N	OIGITAL EQUIPNENT	57- 53	46 5/8	-1 3/4	-5.6
N	ELECTRONIC ASSOC.	2- 5	1 7/8	0	0.0
A	ELECTRONIC ENGINEER.	8- 11	9 5/4	- 7/8	-8.2
O	FOUP-PHASE SYSTENS	13- 19	18 3/8	- 3/8	-2.0
N	POXBOPO	42- 54	46	-1 7/8	-3.9
O	GENERAL AUTOMATIOM	6- 9	7 1/8	- 3/8	-5.0
O	GRI COMPUTER CDPP	1- 1	1/2	0	0.0
N	HEWLETT-PACRAPD CO	69- 87	78 1/2	-1 1/2	-1.8
N	NOMEYWELL INC	44- 55	46 5/8	-1 5/8	-5.3
N	IBN	245-28A	265 1/8	-4 5/4	-1.7
O	NANAGENENT ASSIST	5- 9	7	- 1/4	-5.4
O	MENOREX	23- 34	51 1/4	-2 1/2	-7.4
O	MICROOATA CORP	7- 18	13 5/8	- 1/4	-1.8
O	MOOULAR COMPUTER SYS	5- 8	6 7/8	- 5/8	-8.5
N	NCR	32- 47	45	0	0.0
O	PRINE COMPUTER INC	12- 25	21 7/8	- 1/8	-0.5
N	PEPPIN-ELMEP	17- 22	2D	- 5/8	-3.0
N	RAYTHEON CO	16- 33	51	+1 1/4	+4.2
N	SPERRY RAND	54- 42	54 1/2	-1 3/8	-5.8
O	SYCOR INC	8- 15	11 5/8	+ 3/8	+3.5
A	SYSTEN3 ENG. LABS	5- 8	A 3/4	- 5/8	-8.4
A	WANG LABS.	10- 14	15 5/8	- 3/8	-2.7

LEASING CONPANIES

E X C N		PRICE 1977 RANGE III	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALANTHUS CDBP	3- 5	4 1/2	+ 1/4	+5.8
O	BOOTHE COURIER COPP	8- 10	10 3/4	- 5/8	-5.4
O	COMOI3CO INC	10- 15	12	+ 1/2	+4.5
A	CONNERCE GROUP CORP	2- 2	1 1/4	- 5/8	-35.3
A	CONPUTER INVSTRS GRP	1- 2	1	- 1/8	-11.1
N	DATRONIC RENTAL	0- 2	1	- 1/8	-11.1
A	DCL INC	1- 2	2 1/8	0	0.0
N	DPF INC	6- 9	9	0	D.0
N	1TEL	15- 22	20 1/8	- 5/4	-5.5
N	LEASCO COPP	19- 27	25 1/2	-1	-4.0
O	LEASPAC CORP	1- 2	1 5/4	0	0.0
O	NRG INC	1- 1	1/8	0	0.0
A	PIONEER 7EX CORP	5- 11	5 1/2	- 1/4	-4.3
N	U.S. LEASING	10- 15	14	- 1/4	-1.7

SOFTWAPE & EOP SFRVICE3

E X C N		PRICE 1977 RANGE III	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCEO CDNP TECN	1- 2	7/8	D	0.0
O	ANACONP INC	7- 10	8 3/8	- 1/8	-1.4
A	APPLIEO DATA PES.	5- 10	7 5/8	- 1/8	-1.6
N	AUTOMATIC DATA PRDC	25- 30	25 3/4	-1	-3.7
O	COLENAN ANEPICAN COS	2- 2	2 1/8	+ 1/8	+6.2
O	COMPU-SERY NETHOPK	10- 15	12	D	0.0
O	CDNP ELECTION SY3THS	6- 10	9	0	0.D
O	CDMPUTEP HOPI7ONS	1- 1	1 1/4	D	0.0
O	COMPUTER NETWORK	6- 10	9	- 1/8	-1.3
N	COMPUTER SCIENCES	7- 9	8 7/8	- 1/4	-2.7
O	COMPUTER TASP GPOUP	1- 2	2	0	0.0
D	COMPU7ER U3AGE	1- 5	1 1/4	- 1/8	-9.0
O	COMSNARE	5- 7	7	+ 5/4	+12.0
O	DATA OINENSIONS INC	3- 5	5 3/8	- 1/4	-6.8
O	DATATAB	1- 2	1 1/2	0	D.0
N	ELECTPDNIC DATA SYS.	16- 20	17 1/8	- 1/4	-1.4
O	INSYTE CORP	2- 5	1 5/8	0	D.0
O	1PS COMPUTEP MARKET.	1- 2	1 5/8	0	0.0
O	PEANE ASSOCIATES	3- 4	4	D	0.0
O	REYOA7A COPP	2- 3	2 3/8	- 1/8	-5.0
A	LOGICOM	7- 17	12 1/2	+ 1/4	+2.0
A	NANAGENEN7 OATA	1- 2	2	0	0.0
A	NA7IONAL CSS INC	19- 26	24	- 3/8	-1.5
O	NATIDNAL DATA COPP	4- 7	6 5/4	+ 1/8	+1.8
A	ON LINE SYSTENS INC	17- 22	16 1/2	- 1/2	-2.9
N	PLANNING RESEAPCN	5- 6	5 1/8	- 1/4	-4.6
O	PROGRAMMING & SYS	1- 1	5/8	0	D.0
O	PAPIDATA INC	2- 5	2 5/8	D	0.0
O	REYNOLDS & REYNDLD	17- 2D	19 1/2	+ 5/4	+4.0
O	SCIENTIPIC CONPUTEP3	1- 4	4 3/8	+ 1/8	+2.9
O	TYNSNARE INC	14- 25	20 1/4	-1	-4.7
A	URS SY3TEMS	4- 5	4 3/8	0	D.0
N	WYLY CORP	1- 2	7/8	D	0.D

PERIPHERALS & SUB3YSTENS

E X C N		PRICE 1977 RANGE III	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOORESSOGRAPN-MULT	10- 15	13 1/4	-1 1/8	-7.8
O	ADYANCED MENORY SYS	7- 9	7 5/8	0	0.0
N	ANPEX CORP	8- 11	10 3/8	- 1/4	-2.5
O	ANDERSDN JACDBSON	5- 5	5 1/2	- 1/4	-6.6
N	APPLIEO OIG DATA SYS	10- 20	17 3/8	- 5/8	-2.1
O	BEEHIVE INT'L	8- 12	9 5/4	- 1/8	-1.2
A	BOLT,BERANEP & NEW	7- 8	7 1/2	+ 1/4	+5.4
N	BUNPER-RAMD	8- 12	11	- 1/4	-2.2
A	CALCOMP	5- 5	3	0	3.0
O	CANBRIOGE MENORIES	1- 4	4	+ 5/8	+12.2
N	CENTRONICS OATA COMP	22- 50	28 5/8	-1 1/4	-4.1
O	COGNITRONICS	1- 1	5/8	0	D.0
O	CONPUTEP CONNUN.	5- 7	7 5/8	- 3/8	-4.A
O	COMPUTER CONSOLES	4- 7	4 1/8	- 1/8	-2.9
A	CONPUTER EQUIPMENT	2- 5	5	0	0.0
D	COMPUTER TPANSCEIVER	1- 1	1 3/8	0	0.D
O	COMTEN	9- 15	10 1/4	- 1/8	-1.2
N	COMRAC COPP	19- 28	22	- 1/4	-1.1
O	DATA ACCESS SY37ENS	4- 5	5 3/4	0	0.0
D	DATA 100	6- 9	8 1/8	+ 1/2	+6.5
A	OATA PPODUCTS COPP	9- 1A	15	+ 5/8	+4.3
O	DATA TECHNOLOGY	5- 4	4 1/4	0	0.D
O	OATUN INC	1- 2	2	+ 5/8	+23.D
O	DECI3ION DATA COMPUT	2- 5	2 1/2	+ 1/8	+5.2
D	OELTA OA7A SYSTENS	1- 1	5/8	0	0.D
A	OOCUMATION INC	6- 9	7	- 5/8	-5.0
O	OATAPAN CORP	2- 8	7 5/4	- 1/4	-5.1
N	ELEC7RONIC N & N	4- 5	3 7/8	- 1/4	-A.0
O	FABPI-TEP	1- 2	1 1/8	0	0.0
O	GENERAL COMPUTEP SYS	0- 2	1 1/4	+ 1/8	+11.1
N	NAZELTINE CDPP	9- 12	8 3/4	+ 1/4	+2.9
N	HARRIS CORP	28- 59	56	-1 5/8	-4.5
A	INCDTERN CORP	1D- 15	12	- 1/8	-1.0
O	INFOPEX INC	4- 7	4 3/8	- 5/8	-12.5
O	INFDRMATION INTL INC	9- 14	11	- 1/4	-2.2
D	INTEL COPP	38- 57	45 1/2	-1	-2.1
A	LUNDY ELECTRONICS	3- A	4	- 1/4	-5.8
O	NSI OA7A CORP	6- 12	11 1/8	- 3/8	-5.2
N	NOHAWK DATA SCI	5- 8	6 1/8	- 3/8	-5.7
O	PENFIL CDPP	2- 5	5 7/8	0	0.0
A	PERTEC COPP	7- 9	9 1/8	- 1/4	-2.6
A	PDTTER INSTRUNENT	2- 2	1 5/4	0	0.D
O	PRECISION INST.	2- 2	1 1/2	0	0.0
O	OUANTOR CORP	4- 5	5 1/2	- 1/4	-A.6
O	RECOGNI7ION EQUIP	6- 10	8 5/8	- 1/2	-5.6
O	SCAN DATA	1- 2	1 5/8	D	0.0
O	STDPAGE TECHNOLOGY	10- 16	15 5/8	0	0.0
O	T BAR INC	7- 13	12 7/8	+1	+8.4
O	TALLY CORP.	4- A	4 5/8	+ 1/8	+2.7
A	T6C INC	7- 10	7 1/2	- 1/2	-6.2
N	7EKTRONIX INC	29- 58	37 1/2	+ 1/2	+1.5
N	TELEX	2- 8	2 5/8	- 1/8	-4.5
O	WILTEP INC	1- 1	3/4	+ 1/8	+20.0

SUPPLIES & ACCE3SOPIES

E X C N		PRICE 1977 RANGE III	CLOSE SEP 14 1977	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	A- 8	A 5/8	+ 1/8	+2.0
O	BAL7INORE BUS FOPMS	2- 4	1 5/8	- 3/8	-18.7
A	BARRY WRIGHT	10- 14	12 7/8	- 3/4	-5.5
O	CYBERMATICS INC	1- 1	1	0	0.0
O	DUPLEX PROOUC7S INC	14- 19	17 1/4	- 1/8	-0.7
N	ENNIS BUS. FORMS	6- 7	5 7/8	- 1/4	-4.0
O	GRANAM MAGNETICS	11- 17	16 5/8	0	0.0
O	GRAPNIC CONTROLS	15- 18	15 1/2	0	0.D
N	3M CONPANY	48- 56	51	-1 5/8	-3.0
D	NOOPE CORP L7D	26- 57	27 1/2	- 1/2	-1.7
N	NASHUA CORP	16- 27	25 3/4	+ 5/8	+1.4
O	S7ANDARO PEGIS7EP	18- 25	2D	-1	-4.7
O	TAB PROOUCTS CO	13- 19	1A	D	0.0
N	UARCO	19- 22	19 3/8	+ 1/2	+2.A
A	WABASN MAGNE7ICS	10- 15	12 5/8	+ 1/8	+1.0
N	WALLACE BUS FORMS	17- 21	18	- 1/4	-1.3

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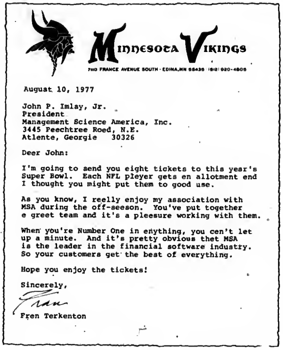

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Oct. 17	Cincinnati	at Pittsburgh
Oct. 24	Minnesota	at Los Angeles
Oct. 31	N.Y. Giants	at St. Louis
Nov. 7	Washington	at Baltimore
Nov. 14	St. Louis	at Dallas
Nov. 21	Green Bay	at Washington
Nov. 28	Buffalo	at Oakland
Dec. 5	Baltimore	at Miami
Dec. 12	Dallas	at San Francisco
Dec. 17	Minnesota	at Detroit

Tie Breaker:

The team scoring the most points in any one of these games will be ____________ (Team).

The game in which the most points will be scored will be ____________ (Date of Game).

The number of points scored will be ____ (Number).

Send this entry blank to:
MSA Super Pool
3445 Peachtree Road, N.E.
Atlanta, Georgia 30326

Please Print

Name ____________

Title ____________

Company ____________

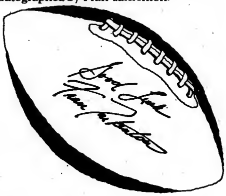
Address ____________

City ________ State ________ Zip ________

Telephone ____________

Void where prohibited by law.

There will be one winner of a Super Bowl Trip for four, two winners of a trip for two, and twenty third place winners who will each receive a leather exhibition football, autographed by Fran Tarkenton.



Entries must be postmarked no later than Sept. 30. Facsimiles of the entry blank are acceptable, however, only one entry per person. An independent judging firm will announce the winners in late December.

So get busy, sports fans. Make your selections and send them in. Someone will win these glorious, fun-filled Super Bowl trips to New Orleans next January, and it could be you!

MSA
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